Original Articles.

A STUDY OF SOME TYPES OF DISTURBANCE OF THE STOMACH AND INTESTINES ASSOCIATED WITH ADHESIONS INVOLVING THE INTESTINAL TRACT, AND THEIR TREATMENT.

By Henry F. Hewes, M.D., Boston.

The influence or function of adhesions involving portions of the gastro-intestinal tract, as a cause of pathological conditions or disturbance of health and function in the body, has always been something of a problem in medicine.

That adhesions, the result as a rule of some inflammatory affection in the abdominal cavity, as appendicitis, or ulcer, or cholecystitis, or tuberculosis, or the result of surgical operation upon the abdominal organs, do cause such disturbance of the bodily welfare with the production of symptoms, has long been a well recognized fact. The extent to which this pathological factor acts as a cause of disturbance, has, however, only recently become well understood, when through the perfection of the method of investigation of the stomach and intestines by the x-ray under the administration of bismuth, it has become possible to diagnose the existence of adhesions and the resulting mechanical effect of these upon the anatomy and physiology of the gastro-intestinal organs, without actually inspecting the abdominal cavity by operation or post-mortem examination.

As a result of the study of this subject under these conditions we have gained much light in regard to the manner of action of this pathological factor as a cause of bodily disturbance, and of the symptomatologies and clinical pictures which are associated with it. This manner of action of adhesions involving the stomach or intestines is very varied.

The primary action of adhesions appears to be either actual constriction or fixation, binding down to the peritoneum or to other organs, of a portion of the gut. As a result of such action we may have anatomically an actual narrowing of the lumen of the gut at the point of contact, or a kinking or looping, at this point or above it or below it. Even actual strangulation of gut or marked interference with blood supply may occur. Or we may have as a result of such constriction or fixation, a drawing of a portion of the stomach or intestines out of normal position, with the production of an abnormal bending or kinking, or simply a functional disability of the gut, in some portion far removed from the actual location of the adhesions.

With such distortion of the gut we get physiologically a disturbance of normal peristalsis and of the passage of the contents of the gut, in the portion affected, the portion where the constriction or kinking, or drawing out of position, whether at the point of adhesion or removed from it, occurs. Such a condition may give rise to the retardation or stasis of stomach or intestinal contents, above or even below the region where the physiological action of the gut is abnormal, or simply to accumulation of gas in portions above the region, or in other cases to increased rapidity of movements of contents by and below the point affected. Associated with the condition such symptoms as pain and distress, distention, constipation diarrhea, flatulence, vomiting, and marked nerve disturbance, or disturbance of nutrition, or possibly symptoms of so-called auto-intoxication may occur.

This constricting or fixing, or drawing out of position of portions of gut, in addition to the actual mechanical distortion of gut which is affected, appears also, in some cases, either as a result of some mechanical action, or by the abnormal functional conditions which are produced, as stasis of contents in the intestine, etc., to give rise to disturbances in the integrity or function of the gastro-intestinal tract, through the agency of reflex action. Thus in cases, spasm, or abnormality of peristalsis of portions of gut, stasis of contents or gas, may occur in portions far removed from the actual seat of lesion without the finding of any anatomical variation in the portion where the function is disturbed. For example, disturbance of the stomach, with imperfect emptying of contents, may occur in cases where no distortion of the stomach or duodenum is present, and where the only abnormality found is adhesions about the cecum and ileo-stasis of contents.

With the great diversity in the location of adhesions involving the gut, and in the forms of distortion which they cause, and with the complicated manner of action of these abnormal conditions upon function, it is clear, *a priori*, that the symptomatologies found in association with this condition of adhesions causing disturbance in the body, must be very varied. As a matter of fact they are, running well through most of the types of symptomatologies of gastro-intestinal disturbance, and of various types of nerve disturbance as well.

Many cases of this kind have, for example, the one symptom of constipation with perhaps some associated abdominal discomfort. Others with or without constipation complain chiefly of flatulence, accumulation of gas, distention, of all-gone sensation and depression.

On the other hand, some cases have violent pain and colic, and tenderness, suggesting appendicitis, or duodenal ulcer, others have severe diarrhea, others gastric symptoms of distress in the epigastrium, belching of gas, vomiting.

The symptomatologies depend to some extent doubtless upon the location of the actual lesion, or the point where the actual distortion of the gut, or functional disturbance induced by the lesion, occur. Exclusively gastric symptoms,

for example, occur more frequently where the adhesions are located near the stomach or high up in the intestine. However, they may occur where the actual adhesions are at the cecum, the fixation at the point and the dragging out of position of the gut resulting, causing distortion at the pylorus or in the position of the stomach. Or they may occur here apparently simply as a reflex from conditions lower down.

Lesions involving the same portion of intestine may in two cases give very different sets of symptoms. Thus some cases with fixation or constriction of the cecum, may have constipation, others may have alternating constipation and diarrhea, others continuous diarrhea, all depending partly upon the actual functional disability which the lesions set up, as retarded peristalsis with stasis in one, extra peristalsis or spasm of the ileo-cecal valve in another, and partly doubtless upon the nervous temperament and constitutional character of the individual affected.

A majority of these various symptomatologies found in association with adhesions, or distortion or disturbance of the gastro-intestinal tract due to adhesions, are clearly in no sense pathognemonic of this condition, since similar symptomatologies are found in association with other pathological or functional disturbances of the body. For example, constipation with some sign of abdominal discomfort, perhaps the most common symptomatology of adhesions, is a frequent finding of purely functional disturbance of the intestines, or of various conditions of organic disturbance other than adhesions. The continuous diarrhea often seen with adhesions is a symptom of functional disturbance, inflammatory colitis, improper assimilation of food. Alternating constipation and diarrhea is a common symptom of mucous colitis and of nerve disturbances. The stomach symptoms seen with adhesions are often similar to those found in nervous dyspepsia, in some cases of ulcer of the stomach and duodenum, and in gall stones.

Diagnosis or probable diagnosis that the symptoms in any given case are the result of adhesions can be made only by supplementing the study of symptoms with an x-ray examination, and in case of a positive finding, an exclusion of definite evidence of other conditions capable of causing similar symptomatologies.

Treatment of conditions of disturbance due to adhesions depends in each case upon the exact character of the pathological lesion or functional disturbance caused by the adhesion. In many cases complete relief of symptoms may be secured by a proper system of medical, as distinguished from surgical, treatment. In other cases surgical interference alone can produce a cure.

Since adhesions and their results are a common cause of conditions of disturbance, and since we possess successful methods of treatment of many of the conditions having adhesions as the primary cause of disturbance, and since the treatment is special in these cases, depending upon an understanding of the exact conditions present, it is essential, that in all cases of gastro-intestinal disturbance which cannot be accounted for by the accurate diagnosis of the existence of other pathological conditions, the possibility of adhesions as the cause of symptoms should be considered, and investigated by proper methods.

As an illustration of this subject, the influence of adhesions as a cause of conditions of disturbance of the stomach or intestines, and of the character and efficacy of special forms of treatment for the relief of these disturbances, I give the records of some cases, selected from the many cases of this type of malady which have come under my observation.

CASE 1. Male. Age 35. For at least 25 years the patient has been subject to frequent attacks of diarrhoea. The spells of looseness last from several days to two or three weeks. The number of movements vary. As a rule there are three or four a day —always very loose. Movements are of brown color. Mucus or blood have never been noticed by the patient. There is pain or cramp at times before a movement. At other times during the attack there may be a dull disturbed feeling in the abdomen. Attacks are more frequent in summer but occur throughout the year.

Food stuffs with large unutilized residue, as fruits and green vegetables always promote diarrhoea—but the trouble may occur on any diet. At times the patient has gone a month without an attack. He may have spells of one regular daily movement, without drugs, for a period of weeks between attacks. Then comes a period of constipation and then an attack. At other times he is constipated throughout the interval.

For the last three years the amount of diarrhoea, and of intestinal discomfort when not having diarrhoea, has been much increased. In 1911 the patient was operated upon for the removal of his appendix. Evidence of the previous inflammation of the appendix was found. Since the operation there has been just as much trouble as before.

There have never been any symptoms of dyspepsia, such as distress in upper abdomen after food, eructations of gas, etc.

The patient loses and gains weight by times but thinks he is always under weight.

Physical Examination: Condition of nutrition good. Haemoglobin 100. Heart and lungs normal.

Examination of faeces, obtained during a spell of looseness, shows a loose unformed stool, not watery, of brown color. No mucus or pus present. Blood test negative. Food elements all increased in amount over normal but no excess of any one form, when patient was on a test diet, as the Schmidt diet. The faeces were excessively acid.

X-ray examination with Bismuth shows

1. No abnormality as to stomach or duodenum.
2. Fixation of caecum to abdominal wall.
3. Marked 9 hour ileo-stasis, some 24 hour stasis in lower ileum, caecum, and ascending colon.
4. The transverse colon in its first portion shows a marked downward loop.

The x-ray report reads: "marked ileo-stasis with fixation of caecum by adhesions and an abnormality

of the transverse colon suggesting the possibility of kinking at this place."

The record of the case with the clinical history of alternate constipation and diarrhoea, the finding of ileo-stasis, of adhesions fixing the caecum and of the abnormality in the colon, suggests the following theory of the case.

As a result of a tendency to stasis of contents in the intestine, due probably to the fixation of the caecum and the abnormality in the anatomy of the colon, the intestines are not freely emptied regularly. The backed up intestinal contents, either by fermentation and consequent irritation of the gut, or by reflex action coming as a result of the abnormal quantity present, induces, at periods, increased peristalsis to relieve the condition, and periods of diarrhoea follow.

Acting upon this theory of the case the patient was placed under the regular administration of agar agar powder, mixed with small portions of calcium carbonate, with the idea of keeping the bowels regular without the use of cathartic drugs, that is to prevent the gradual backing up of the intestinal contents which in the past has preceded the diarrhoea attacks.

The diet used consisted of meat, fish, eggs, bread, potato, macaroni, rice, simple cereals, peas, custard, ice cream, eliminating foods with large refuse as fruits or green vegetables.

This system was installed June last. Since that time the bowels have moved daily with good full formed movements. There has been but one period of looseness, occurring about two weeks after the system was started, and this lasted but two days.

Otherwise there has been a complete disappearance of symptoms. This period of five months of freedom from symptoms is much the longest that the patient has ever had, and the result of the study of the case has so far indicated that the malady, or abnormal condition, can be controlled by this method of treatment.

Case 11. Male. Age 55. In 1886 the patient had a bad attack of diarrhoea in the summer lasting two weeks. Since that time he has been subject to occasional periods of diarrhoea lasting for a few days. These periods he has found as a rule follow a few days of constipation. For most of the time however between 1886 and 1910 his bowels have been regular and he has suffered only from the occasional attacks of constipation and diarrhoea coming perhaps three or four times a year.

In 1910 he was operated upon for the removal of the appendix. The organ was found to be acutely inflamed with some serum in the peritoneal cavity. Since this operation he has suffered almost constantly from constipation and has had to use drugs regularly for his bowels. There has been the same history of an occasional spell of looseness independent of the use of cathartics. In this period he has suffered at times from dull distress in his lower abdomen.

In 1911 in July he had a severe attack of diarrhoea lasting three weeks which was called colitis by his physician. He had several short attacks of diarrhoea up to October. From October, 1911 to July, 1912 he was constipated with rare short periods of diarrhoea. Since July, 1912 he has had alternate periods of constipation and diarrhoea, and marked intestinal discomfort much of the time. That is he has been constipated for a period of 2—3 weeks then had a few days of diarrhoea, then another period of constipation.

In the diarrhoea periods the faeces have contained much mucus. No blood noted.

Sept. 1st in London he had an x-ray investigation. The report of this examination is as follows.

"Marked ileo-stasis and caecal-stasis. Evidence of an abnormal condition of the walls of the caecum. Evidence of the existence of adhesions in the region of the caecum."

In London where his symptom at the time was constipation with much intestinal discomfort, he was placed on a treatment of paraffin oil and senna, used daily, and he has been on this treatment since. Under this regime he has had continual looseness of the bowels, one to three daily movements, and much discomfort.

He has not noticed that diet has much effect upon his trouble in the past.

Examination Nov. 8, 1912.

Physical Examination Normal. Haemoglobin 100. Examination of faeces—stool very loose and filled with gas bubbles, mucus present, no pus. The faeces were very acid. Blood test negative.

In the early history of this case we find a tendency to an occasional period of constipation followed by a day or two of diarrhoea. For most of the time the bowels were normal.

After the appendix operation constipation became a continual trouble with an occasional loose spell. It seems probable that this condition of constipation was due principally to the effect of the adhesions about the caecum following the appendicitis, or the operation for the removal of the appendix.

In recent periods with the more marked constipation, the diarrhoea spells have been much more severe and the amount of intestinal discomfort much increased.

During the last months there has been continued looseness, due probably to the constant use of cathartics, and continued intestinal discomfort.

As a result of the study of this case the theory was adopted, as in the first case, that the spells of diarrhoea were due primarily to the constipation, and tendency for the contents to collect or stagnate in the intestines. The primary cause of the trouble was in this case adhesions and injury to the intestinal wall.

The first step in the treatment of this case was the removal of all cathartics, under the use of which the patient had not prospered, to study the case under natural conditions. Injections of oil were given to promote defecation.

Under this regime the patient would go for several days with regular movements, then there would come a day of much intestinal discomfort followed by explosive diarrhoea. The faeces passed on these occasions were very foul. No one predominant form of bacteria could be isolated. Always a large growth of colon bacillus was present. An excessive growth of the gas bacillus was present.

Apparently even with the enemata there was the same tendency to stagnation of contents high up, which characterized the case, less marked with the enemata but still present, and the following intermittent periods of diarrhoea.

The patient was then placed upon regular administrations of agar agar powder and calcium carbonate.

Under this regime large daily defecations of formed faeces occurred, the occurrence of diarrhoea spells became less frequent and finally ceased. The

patient is now going upon doses of agar alone, and is practically without symptoms for months at a time.

These two cases, with evidence of the existence of adhesions and abnormality of the gut in the region of the cecum and first portion of the colon, show a marked similarity in their clinical character. In both we have as the principal symptom the intermittent occurrence of periods of constipation and diarrhea. In both the symptoms yielded to the same form of treatment devised to prevent the occurrence of the stagnation of the intestinal contents by promoting regular peristalsis all along the line.

The clinical findings in the two cases differed, however in one important feature. In number one the examination of the feces never revealed any abnormality save the looseness of the stools, with the evidence of excessive fermentation. In number two, however, mucus was always found present in the earlier examinations of the feces. In other words, the second case had some resemblance to the condition known as mucus colitis, in which as you know, the symptoms are frequently of a type similar to those seen in this case, that is, symptoms of alternating constipation and diarrhea. This observation on this case is one of many which tend to substantiate the well- known theory that many conditions described as mucus colitis are in reality symptom-complexes representing the result of the existence of adhesions involving the colon.

This type of symptomatology seen in these two cases represents one of the most common clinical pictures associated with adhesions involving the intestinal canal. In cases with this type of symptoms the lesion is as a rule in the region of the caecum or colon, or possibly the ileum. The cases come to the physician complaining, as a rule, of the diarrhea. But it is the constipation which must be treated, even in the cases which do not show the ordinary sign of constipation, that is, cases which have a regular daily movement of the bowels.

Before instituting treatment in these cases the physician must first establish the fact that adhesions, or distortion of the intestine, or caecal- or ileo-stasis are present. For the symptomatology alone does not necessarily mean this condition. It may occur from other causes where the specific treatment used here is not efficacious, as, for example, in some cases of actual colitis, in conditions of neurosis or debility, or from improper diet. Once assured that the lesion in question is present as a probable cause of the symptoms, the medical treatment described should be instituted. If this fails, operative procedures for cure may be considered.

As regards the treatment of cases of this type, that is, conditions of adhesions affecting the gut giving this special type of symptomatology of alternating constipation and diarrhea, it may be said that the general principle is the promotion of undelayed progress of the intestinal contents throughout the course of the alimentary canal, and the consequent prevention of stasis or stagnation. The details of the treatment are not necessarily in all cases the same. In these two cases the agent which was used successfully to promote regularity of action of the intestines was agar agar. This acts primarily by giving bulk to the intestinal contents and thus promoting peristalsis by natural means similar to the action of plentiful food residue. It does not act as a cathartic drug in the ordinary sense of the term, that is by stimulating peristalsis, by unnatural action upon the walls of the intestine, or by causing an unnatural or liquid condition of the feces.

Promotion of active peristalsis or excessive movement of the intestinal contents by means of real cathartics is not in my experience a successful means of cure in these conditions; at all events not as successful a means as the use of agar or of some therapeutic agent acting along similar lines. In the first place they are apt to cause continued looseness even if ileo-stasis is prevented. Secondly, they act more upon the colon than upon the region of the lesion. Case two, as you remember, had been subjected to a course of cathartic administration for a considerable period before I saw him, with no improvement in the condition.

The same statement may be made in regard to the use of enemata for the treatment of this condition. These agents may prevent constipation in the sense that they ensure regular defecation. But they do not in all cases promote regular movement of the intestinal contents in the region of the lesion, which is frequently too high up to be affected by them. They simply clear out the lower bowel, leaving the ileo-stasis as before. They may work where the adhesions or dilatation of the gut is situated in the transverse or descending colon. But at best they are a cumbersome and artificial means of treatment as compared with the agar.

Many cases of this type do not show actual constipation in the sense of absence of a daily movement. The constipation is higher up than the colon.

In the considerable number of cases of this type which I have treated successfully by medical means, I have found the administration of agar agar the most universally serviceable of any one means of achieving relief of symptoms. It can be taken continually over long periods of time without necessity for increase or dosage such as is seen in the use of cathartics, and cannot be said to inculcate a habit save in the sense that the use of foods with large residue, fruits, etc., may be said to cause a habit. Often it may be necessary at the start of treatment to use a cathartic or enema, but this should be discontinued after a few days.

In some cases of this condition other means of promoting regular intestinal action are equally successful, or even more successful. Some cases show complete relief under the use of Russian oil or other paraffin oils; others do well under a

system of massage or of exercises devised to promote action of the abdominal muscles. In some cases a combination of all these agents is necessary.

A considerable number of these cases do not yield to any form of medical treatment. In such cases surgical interference for the removal of adhesions, or short circuiting of the intestine may result in cure.

Case 3 represents another type of intestinal disturbance associated with this same underlying condition of adhesions involving the gut.

A. M. Age 25. Date of visit March 20th, 1913. For 8 to 10 years the patient has been troubled with diarrhoea. The trouble has been present to some extent almost continually during the time. Most of the time there are three to five movements daily, loose in character. There is no special pain associated with the trouble save some colic just before a movement, but often there is a sense of discomfort in the lower abdomen associated with excessive rumbling of gas.

Occasionally the patient will have a period of three to five days when there is but one movement daily, sometimes a formed movement. Very rarely this has occurred for as long a period as two weeks. Following such periods the patient almost invariably has a period of excessive diarrhoea starting with fifteen to twenty movements daily and gradually getting down to three or five a day. The periods of looseness last three weeks to two months. Rest in bed in such periods may reduce the number of movements to one or two a day but then diarrhoea always returns upon resumption of regular manner of living. The patient loses and gains weight in turns but never weighs as much as she should. She is not very strong but her general condition is not as bad as might be expected with such a history. She is able to work except in the periods of very severe diarrhoea. There is no history of symptoms at any time suggesting an attack of appendicitis. No typhoid.

Examination: The patient is thin but fairly nourished. Haemoglobin 90%. Blood examination otherwise negative. Temperature normal. Pulse 80. Heart and lungs normal. Abdominal examination negative except for a slight tenderness in the right iliac fossa.

Examination of Faeces. Stool loose, about the consistency of porridge. No mucus, pus, or blood present. Blood test negative. Food elements present in increased amount but no excess of any one form, suggesting a specific fat or cellulose diarrhea.

The patient was advised to have an x-ray examination of the abdomen. In the meantime she was placed upon a regime consisting of a low refuse diet consisting of meat, and toast without butter, and the administration of bismuth. Under this regime, according to reports by letter the condition continued unabated. For a day or two under the bismuth there would be one daily movement but this was always followed by excessive diarrhoea. For some reason the x-ray examination was deferred.

April 10th the patient reported that for two days she had had a good deal of pain in the right iliac region and some nausea, but no vomiting. The bowels were loose as usual.

Examination at this time showed marked tenderness in the right iliac fossa with, however, no palpable mass. Temperature 100. Pulse 100. Blood showed a white count of 12000 per cmm.

The patient was placed in bed. The temperature remained between 99 and 100.5 for four days, then subsided to normal. The tenderness decreased but never wholly disappeared. This represents the first record of any disturbance suggesting appendix trouble in the history of the case.

Following this the x-ray examination with bismuth was made. It showed evidence of adhesions in the region of the caecum. The caecum was firmly bound down and immovable. The bismuth could be seen by the fluoroscope examination to pass freely back and forth through the ileo-caecal valve as if the valve were continually open. There was no ileo-stasis and no marked caecal stasis.

The explanation of this case as deduced from this record appeared to be the following:—As a result of an attack of appendicitis which occurred perhaps 8 to 10 years ago and was unrecognized, adhesions were formed binding the caecum and so affecting the gut that the ileo-caecal valve was not properly closed. April 10th, 1913, a slight recurrence of inflammation in this region occurred. As a result of this abnormal condition in the region of the caecum the contents of the intestine passed continually through the valve in both directions, thus keeping up a nearly continuous diarrhoea.

The patient was operated upon June 25th. The finding at operation was as follows:

A nearly obliterated appendix bound down by adhesions. Adhesions about the caecum binding it firmly to the peritoneal wall and apparently pulling upon the region of the ileo-caecal valve in such a manner as to keep the valve open.

The appendix was removed and the adhesions were separated to obviate all distortion and fixation of the caecum. Since operation there has been up to the present date, Jan. 1, 1914, complete freedom from diarrhoea.

This case differs from the first two in that the symptomatology was one of continuous diarrhoea rather than alternating diarrhoea and constipation, and that physiologically excessive peristalsis of the contents through the ileo-caecal region, rather than retardation, was present.

This case showed a symptomatology, continuous diarrhoea, less common in association with adhesions affecting the gut, than that found in the first two cases, alternating constipation and diarrhoea, but still not uncommon as an associate of this condition.

Apparently the effect of the adhesions in the case, as revealed both by x-ray examination, and examination at operation, and as suggested by the symptomatology, was to increase the activity of the movement of the intestinal contents, in marked contrast to the condition in the first two cases, where the effect was to retard the proper movement of the contents. Whether this result was due to actual distortion of the valve, or to spasm or reflex action I cannot say. At operation the valve appeared to be open.

I have seen several cases of this type showing an open ileo-caecal valve as revealed by x-ray examination, both under administration of bismuth by mouth, and by the use of bismuth enemata. Some of them show caecal- and ileo-stasis of bismuth in spite of the open valve, while some, like this case, show no stasis. Most

of them showed symptomatology of more or less continuous diarrhea except when kept in bed, as contrasted with the alternating constipation and diarrhea, or the continued constipation seen in the majority of cases of adhesions affecting the caecum or colon.

CASE 4 is an example of adhesions involving the intestine, giving a symptomatology of stomach disturbance, rather than intestinal disturbance as seen in the cases already reported.

Aged 55. Date of visit October 26, 1912. For a year or more the patient has suffered from dyspepsia. Two or three hours after meals he has a gnawing sensation in the pit of the stomach, associated with the belching of gas. There is no acute pain, no pyrosis or vomiting, occasional heartburn. The distress comes late in the forenoon, in the late afternoon, and sometimes at bed time, also at times in the early morning before breakfast. The taking of food, even of a few crackers, always relieves it. There is no distress immediately after meals, in fact, as stated, meals relieve symptoms. The spells of trouble are intermittent. He may be entirely free from symptoms for four days to a week and then have symptoms daily for one to three weeks. The bowels are regular. There is no appreciable loss of weight, but the patient has become very nervous and does not feel up to the mark as before this trouble began. There is no history of a former attack of appendicitis or of typhoid.

Examination. Well nourished. Haemoglobin 100%. Heart and lungs normal. Abdominal examination normal.

The fasting contents of the stomach obtained by tube twelve hours after the previous meal, a full dinner, gave the following findings: Amount 55 cc. Clear and watery, with slight sediment consisting, as seen under the microscope, of a considerable number of starch granules and fat drops. Free HCl was present. Blood test negative. Test meal contents obtained one hour after Ewald meal showed a total free HCl of 0.28%—that is, an excessive amount of acid.

The faeces gave a negative blood test upon several occasions. Stools were of normal size and character.

The results of this special examination of the stomach, together with the symptoms, suggested the presence of some lesion causing some constriction or spasm of the gut at or near the pylorus, or in the duodenum. The symptoms could have gone perfectly well with a simple hyperacidity, but the presence of 50cc. of acid contents, a hypersecretion, with an abnormal amount of food residue, as microscopically observed, a slight stasis in the stomach, suggested the existence of either an old ulcer in the duodenum or of some other cause, resulting, either by actual constriction or by reflex action, in the undue accumulation of gas, and possibly at times, of acid contents in the stomach.

X-ray examination showed

1. A marked six hour bismuth residue in the stomach.
2. Pyloric sphincter and duodenal cap well defined but dilatation of upper portion of duodenum apparent.
3. Nine-hour ileo-stasis, and evidence of adhesions about caecum.

From the combined findings an absolute diagnosis of some process causing a tendency to backing up of contents in the stomach, and a probable diagnosis of old duodenal ulcer as the underlying process, was made. Medical treatment was tried for a considerable period, as the tendency to stasis in the stomach was so slight that it was hoped it could be overcome by a proper method of dieting and hygiene. Improvement in symptoms but not cessation occurred. The case was then operated upon.

The findings at operation were:—

1. Adhesions between the duodenum and right wall of the abdomen. Some dilatation of duodenum above adhesions. No ulcer was found.
2. Evidence of a former appendicitis with adhesions about cecum.

The patient at the present time, six months after operation, has a complete absence of symptoms.

Note that in this case there was in the clinical findings, the findings by tube and the x-ray findings, evidence of disturbance of the function of the stomach in emptying its contents within the normal period, although by the finding at operation it was found that the adhesions present caused no actual obstruction of the pylorus or pulling or distortion of the stomach.

This is an example of what I have already described as the reflex action, of adhesions involving the gut, the setting up of disturbance of function, stasis and hyperacidity, and of subjective symptoms, in a portion of the gut in a region removed from the actual point of the adhesions, with no actual distortion present in the former region.

Six-hour gastric stasis of bismuth, less commonly twelve-hour stasis of food contents, are not infrequently found in cases where the adhesions are confined entirely to the cecum. In some cases such adhesions, though located far from the stomach, do by their dragging of the viscera out of position, cause some actual distortion of the stomach, or disturbance of its function, by actual mechanical effect. It is thought by some that ileo-stasis with consequent dragging down of the viscera by the load may sometimes do this. But in this case, as in several others, the stasis in the stomach appears to have been reflex from the action of the adhesions upon peristalsis lower down.

CASE 5. F. P. Age 38. Date of observation Nov. 9, 1912.

History. Five years ago the patient was operated upon for an acute attack of appendicitis. About one year after this he began to notice a heavy feeling in the epigastrium coming soon after eating. This was not present every day but bothered him off and on. One year ago the stomach symptoms became much more constant and troublesome. Distress soon after eating was often very marked. There was accumulation of gas in the stomach with distention and relief by belching at times. Six months ago the patient was jaundiced for a period of two months. At present he suffers from dyspepsia most of the time, is afraid to eat, and has lost fifty pounds

in weight. His bowels are regular. He has never vomited.

Examination. Haemoglobin 90%. Fasting contents of stomach, 10 cc. No food. No blood. Inflation shows size and position of stomach normal. Test meal contents. Free HCl=.05%.

X-ray examination. Peristalsis of stomach normal. No 6-hour bismuth residue. Caecum firmly held down by adhesions. Stasis of contents in ileum and in caecum. Operation showed adhesions fixing the caecum, adhesions extending from caecum and ascending colon to gall bladder and involving the region of the common duct and portal vessels.

January 1, 1914. Since the operation the patient has been free from symptoms.

In this case the symptoms, with the exception of the jaundice, were mostly those suggesting stomach disturbance. No evidence of actual stasis in the stomach, as in the last case, was found. It is true that the symptoms of distress, and of accumulations of gas, complained of by the patient, and laid by him in his stomach, may have been pain and accumulation in the intestine. But at all events the history was one of stomach disturbance.

SERODIAGNOSIS OF PREGNANCY. A REVIEW.*

BY A. K. PAINE, M.D., BOSTON.

ONE of the striking recent advances in obstetrics has been the formulation of the serodiagnostic test of pregnancy.

Needless to say, the diagnosis of the existence or non-existence of pregnancy is a factor of considerable importance in obstetrics, and it is true, as with many other things in the practice of medicine, that its solution depends almost entirely on individual judgment, subject to all the uncertainties and errors which attend such efforts. That individual skill and much experience increases the percentage of opinions that later prove to be correct is also true, but opinions only they remain until proved or disproved.

The wonderful advances made during the last two decades in the practice of medicine are the result largely of the illumination here and there of its mysteries by the bright light of scientific accuracy emanating from the modern medical laboratory. That this irregular illumination discloses complexities beyond even our imaginations only emphasizes the utter darkness in which we have struggled.

For the first time it seems a possibility that the subject under discussion may be lifted from the plane of conjecture to that of accuracy. Various attempts have been made to develop some method whereby the diagnosis of pregnancy could be accomplished by enlisting the aid of the laboratory; the antitrypsin test as carried out by Franz, Jarish, Rosenthal and Jochmann was one of these, a marked increase in the antitrypsin index indicating pregnancy, but as such an increase is also observed in a great number of diseases and disorders, its value as a diagnostic aid was nil. The complement fixation test of Fieux and Mauriac is open to the same objections, while the epiphanin reaction of Mosbache and the adaptation of the miostagmin reaction by Julchiero are impracticable and not confirmed.

It remained for Emil Abderhalden, director of the Institute of Physiology at the University of Halle, to offer a method whereby the diagnosis of pregnancy may eventually become a procedure of scientific accuracy.

This procedure is based on certain facts which have been disclosed by researches in the biochemistry of protective ferments. It has been demonstrated that substances containing elements common to body tissues, but of a different formation are, when introduced into the body, altered by various processes until their composition corresponds to that required by or acceptable to the body. The digestive process itself by which food is converted into body tissues represents perhaps the most commonly considered type of this procedure. Further, if these foreign substances are introduced directly into the blood there is created in the blood an agent described as a protective ferment, which attacks the foreign substance, reducing or changing it to substances tolerated or acceptable to the organism. Again, and of even greater interest and importance, each specific substance which may be introduced causes the formation of a specific protective ferment which attacks that substance, but no other. It is along these lines that Abderhalden has been working, and some of his experiments are extremely interesting.

If the serum of a dog is placed in a polariscope together with cane sugar no rotation occurs, indicating that there is no cleavage between the two, but if the dog's blood has first received an injection of cane sugar, that serum placed in a polariscope with the sugar exhibits rotation or cleavage, indicating that there was developed in the dog's blood as the result of the presence of the foreign matter, sugar, a substance which has the property of attacking sugar, changing its structure to one acceptable to the organism.

Abderhalden has further shown that substances natural to the body are foreign to the blood when introduced directly into it, causing the appearance therein of specific protective ferments. For instance, kidney tissue, or cells introduced into blood cause the appearance of ferments which are specific for such tissue, and further that such ferments are specific for the kidney tissue from other dogs as well. Another fact on which this procedure was based was the demonstration by Schmorl, Veit and Weichardt, that shortly after pregnancy begins and continuing for some days after its termination, chorionic epithelial tissue or cells from time to time enter the maternal circulation. Abderhalden was able to demonstrate that these chorionic cells

* Read before the Boston Surgical Society, Dec. 18, 1913.

in the blood stream gave rise to the formation of a specific protective ferment which attacks these cells, causing them to lose their individuality, becoming thereby acceptable to the blood, and Abderhalden's serodiagnosis of pregnancy consists in the demonstration of these protective ferments in the blood of a pregnant woman. The demonstration itself consists in showing that the serum of a pregnant woman will react on placental tissue, *i.e.* chorionic cells, outside of the body, owing to the presence in the serum of these ferments with a predilection or specificity for chorionic tissue, these ferments being developed in the blood of the pregnant woman to combat the invasion of its stream by chorionic cells, an occurrence continually happening, as shown by the work already mentioned, and corroborated by the investigations of Peters, Strahl, Beneche, Brice, and Teacher, who further showed that these cells are present in the blood stream as early as the first month of pregnancy. With these chorionic cells in the maternal blood, protective proteolytic ferments are mobilized which will cause cleavage of human placental albumen and its reduction into peptones and amino acids. Abderhalden states that there is in all probability a much greater exchange of substances between the placenta and the maternal blood during pregnancy than simple chorionic cells, which opens up a field of vast possibilities in the investigations of the various phenomena of pregnancy, particularly with reference to the so-called toxemias which may represent some disturbed balance between the entrance of various substances foreign to the blood and the production of the protective ferments to combat such an invasion. The study of the protective ferments offers an alluring prospect in other subjects than obstetrics, the work of Fuchs being especially interesting. He reports experiments which confirmed the absolutely specific nature for the organ involved of the ferments demonstrated by the Abderhalden technic. The serum of rabbits treated with human kidney tissue was able to digest kidney tissue in eighty-eight hours, while it did not digest liver tissue, and vice versa. He has also confirmed in further research the findings of others in regard to the specific digestion of testicle tissue by the serum of men with dementia precox and of ovary tissue by women under similar circumstances, but never the reverse. Also the total absence of any digesting property for the ovaries or testicles in the serum of patients with depressive mania, and further, the positive reaction in cancer cases. The reaction proved specific for the organ whether derived from human beings, calves or laboratory animals, and it was equally pronounced irrespective of the species.

The diagnosis of pregnancy by demonstrating the presence in the blood of a proteolytic ferment specific for placental albumen, as can be imagined, is a complicated procedure necessitating laboratory technic of a high grade. Abderhalden has from time to time changed, improved, and simplified his technic, all the while insisting upon the necessity of an absolute regard for the most minute details of the work. That other investigators were, especially in the beginning, unable to secure the same results as he himself did he attributes to errors in technic, and that most investigators appreciated this fact is witnessed by the character of their work, which improved as they eliminated the various sources of error. To illustrate the ease with which the results may be negated, one instance might be cited. Two investigators, Schimpert and Hendrey, working in Freiberg, were unable to substantiate Abderhalden's results. They went to Halle and worked in his laboratory perfecting their technic, but on returning to Freiberg again failed with their tests, when investigation soon disclosed the fact that the water of Freiberg, which was used to wash the placental tissue, was so soft as to cause a hemolysis of the blood in the placenta, resulting in a contamination of their material, and so a distortion of their results. Correcting this difficulty by the addition of salt to the wash water, they were then able to duplicate Abderhalden's work. Without reviewing the earlier technic of Abderhalden, in which a special polariscope was used to demonstrate cleavage between placental tissue and serum containing the specific proteolytic ferment, a brief description of the technic as employed at the present time may be given,—the so-called dialysation method. The theory and procedure by which the serodiagnosis of pregnancy is made may be first very briefly stated. The serum of a pregnant woman contains a specific proteolytic ferment, which has the power to digest placental albumen. Pregnancy can be diagnosed by demonstrating the presence of this ferment in the blood serum. Its presence in the serum can be shown by the addition of such a serum to placental albumen, resulting in a digestion of the albumen.

The serum is removed from a few c.c. of blood taken from a supposedly pregnant woman; this added to a small amount of thoroughly washed human placental tissue, is placed in a parchment bag (called a dialyser); the bag is then immersed in distilled water contained in a glass dish, the whole being incubated for a proper period. At the end of this period if the serum contains the proteolytic ferment present in the blood of a pregnant woman a more or less complete digestion of the placental albumen will have occurred. The parchment bag has the peculiar property of retaining albumen, but of allowing the products of albumen digestion to escape, that is, its walls are impervious to colloid substances, as albumen, or serum, but are pervious to crystalloid substances, as peptones, amino acids, etc, *i.e.* the end products of albumen digestion. So if any digestion of the placental albumen in the bag occurs as the result of the presence of a specific proteolytic ferment in the serum which was added to it, some of the products of its digestion

will escape from the bag into the surrounding sterile water, where their presence is determined by a delicate reaction in which a substance ninhydrin is used. This latter is a salt, which added to a solution containing peptones, polypeptids or amino acids gives a violet color on boiling, even though the amount of these end products of albumen digestion be exceedingly small.

While the theory of the procedure is comparatively simple, the actual practise of the test demands a high grade of laboratory skill and a most painstaking regard for the minutest detail. The following description of the test is as brief as is compatible with accuracy.

1. *Serum.* Thirty c.c. of the patient's blood are withdrawn from one of the superficial veins at the elbow, using a glass syringe of the type employed for antitoxin or serum administration. Needless to say, strictest aseptic technic is required. The serum from this blood should be used the same day, and it is important that it be free from corpuscular elements, bacterial contamination, and that no hemolysis has occurred.

2. *Placental Albumen.* This is obtained from fresh normal placentas, from which the membranes and fetal surfaces are removed. The placenta is cut in portions the size of a twenty-five cent piece and washed in running water to remove blood. It is then boiled in water containing two drops of glacial acetic acid to each two litres for five minutes in a porcelain dish; it is then boiled in a fresh water for another five minutes, when the water is tested after filtering for albumen, using the ninhydrin test. If the test is positive the placental tissue is boiled again and repeated until the filtered water is negative for albumen. The coagulated albumen, together with the last water, is placed in a glass jar and covered with a layer of toluol, the latter a balsam preparation which acts as a cover to prevent contamination of the contents of the jar. It is now ready for use, but should be tested on each occasion it is used, if more than one day elapses between tests. The important thing is to be sure that it is free from all dialysable substances, as peptones, alpha amino acids, etc.

3. *Dialysers.* The dialysers are porous parchment bags, those made by Shleicher and Schnell, No. 579A, being the most satisfactory. Each bag must be tested for the permeability of peptones and the non-permeability of albumens.

To test for permeability of peptones, 5 c.c. of a 1% solution a "Seiden" peptone with 20 c.c. of sterile water are placed in the bag and incubated for 16 hours at 29°C. The dialysate is then tested for peptone with ninhydrin; a moderate color indicates that the dialyser is suitable, a weak or strong color indicating that the dialyser should be discarded.

To test for the non-permeability of albumen, a solution of egg albumen is placed in the bag, and after incubation the dialysate is tested for albumen, a negative result indicating that the bag is a suitable one. After these tests the dialysers are washed and boiled, and then kept in chloroform water covered with toluol. They are washed and boiled after each test, and should be from time to time retested for permeability as indicated above.

4. *Ninhydrin* is the trade name of Triketohydrindenhydrate, a salt discovered by Ruheman, which when added to a solution containing albumen, peptones, polypeptids, or the amino groups in the alpha position to the carboxyl group gives a violet color on boiling. It is much more delicate and sensitive than the well known biuret reaction.

The fact that "ninhydrin" reacts with protein derivatives which no longer give the delicate biuret reaction, has made it doubly useful in following the transformations of the albuminous substances into their non-protein components. In order to ascertain to what extent abiuret compounds, which react with triketohydrindenhydrate, though they do not give the classic biuret reaction, may be distributed in the organism, Abderhalden and Schmidt have made an extensive search for such reacting substances. These were duly found existent in fresh milk, urine, saliva, blood-plasma and serum, lymph, sweat, the contents of cysts, egg, and meat, and it is necessary in the execution of tests involving the use of the reagent, to employ special precaution against contamination with skin secretion, small traces of which are sufficient to initiate a positive reaction.

As the result of applying the new ninhydrin test, Abderhalden has already found that certain biologic reactions, hitherto ascribed to the proteins, are associated with the presence of biuret contaminations which give the reaction. Thus it appears that various proteins which provoke distinct physiologic responses when introduced into the body lose this property if they are first purified by dialysis until the compounds reacting with ninhydrin completely disappear. The bearing of this on the study of anaphylaxis will at once be apparent. Abderhalden insists that all proteins employed in anaphylactic investigations must be subjected to thorough purification by dialysis before the responses which they may elicit are charged to the protein itself rather than to derived products accompanying it.

5. *Containers* should be of glass, sterilized, and should be of sufficient size so that there will be 1 c.m. between the walls of the container and the dialyser when the latter is placed in the container.

Technic of the Test. A dialyser previously tested as described is removed from the chloroform solution and washed. In it is placed one gram of the placental albumen, which is free from all dialysable substances. To this is added 1.5 c.c. of serum from the supposed pregnant case, after which the dialyser is washed in running water to remove any possible albumen contamination from its outer surface. It is then placed in the container with 20 c.c. distilled

water; the top of the water should be 25 cm. above the top of the dialyser contents and covered with a layer of toluol. The container is closed with a sterile cotton plug and placed in an incubator at 37.5° C. for 16 hours, at which time the dialysate is tested for the presence of the products of albumen digestion. Ten c.c. of it are taken free from toluol and placed in a small beaker. To it are added 2 c.c. of a 1% solution of ninhydren, after which it is boiled for one minute after the first bubbles appear. The color is read after thirty minutes.

A clear or yellow color denotes a negative result. A violet, light lavender, or bluish purple color denotes a positive result.

Controls. As with similar tests, a control test is necessary to insure the accuracy of the results. Fifteen c.c. of serum alone is placed in a separate dialyser, the dialysate being tested after incubation in the same manner, or 15 c.c. of serum may be inactivated by heating at 60° C. for ten minutes, after which it is placed in a dialyser with one gram of placental albumen, incubated and tested as before.

Jellinghaus and Losee give the following as the method of interpreting a test.

Dialysate negative with ninhydrin, controls negative, not pregnant.

Dialysate positive with ninhydrin, controls positive, not pregnant.

Dialysate positive with ninhydrin, controls negative, pregnant.

Dialysate positive with ninhydrin, controls positive, but distinctly lighter in color, pregnant.

They emphasize the need of minute attention to details and enumerate those especially needing care.

1. The placental tissue must be fresh.

2. The placental tissue must be free from blood.

3. If washed in very soft water salt should be added to avoid the possibility of hemolysis. After the blood is removed with the water containing salt, further washings are with plain water.

4. The placental tissue prepared for the tests should be tested each day before use for the presence in the water of any substances giving a positive reaction with ninhydrin; should any be present it should be reboiled as described in its original preparation.

5. The dialysers should be frequently tested with albumen and peptones for permeability.

6. The serum must not be hemolyzed and must be free from dialysable substances. It should be used from two to five hours after obtaining.

7. The contents of each vial of ninhydrin should be measured, as they do not always contain a full gram. Two c.c. of a 1% solution is used; this solution will keep seven days.

8. Emphasis is laid on the need of observing strict asepsis in handling the materials for the test and on the aseptic condition of all containers and utensils.

Coming to the practical and therefore interesting and important aspect of the test, we may first admit certain facts as sufficiently proven: first, the blood of a pregnant woman contains at least one substance peculiar to the pregnant state, *i.e.* a proteolytic ferment specific for chorionic epithelium (placental albumen), and second, that it is possible to demonstrate the presence of this substance by a bio-chemical test. The questions that immediately arise are: Is the test practical from the point of view of ordinary laboratory technic? Is it reliable? Can it be useful in the general practice of obstetrics? Or is it only of ultra scientific interest, a by-product of the research laboratory? The questions can best be answered by a generalized review of the work of the various investigators of its merits. That it has awakened much interest in the scientific world is evinced by the volume of literature on the subject published since Abderhalden's first reports in 1912. It is interesting and natural perhaps that the greater portion of articles concerning it are of German origin; next to Germany this country has been most prolific in its contributions. There have been reported in all considerably over two thousand cases in which the test has been applied. A study of these reports indicates several striking facts: first, that the reports of the early tests of the various investigators show a much higher percentage of failures than the more recent works of the same investigators and that the earlier failures were almost invariably because of faulty technic, a fact testified to by the authors themselves. Second, that the enthusiasm for the accuracy and practicability of the test increases rather than diminishes with the increasing familiarity with its details as acquired by the men engaged in the work.

It may be stated that there is almost an unanimity of opinion that the test is accurate in results and practicable in performance. Some investigators have questioned, however, the specificity of the ferment, their results seeming to show that positive reactions are possible with other conditions than pregnancy. For instance, Williams and Pearce state that it was never negative with a known case of pregnancy, but was also positive in two cases of nephritis, one of tabes, one of infectious carbuncle, and occasionally in perfect health. On the other hand, Schwarz vehemently attacks the work of Williams and Pearce, declaring their technic faulty and intimating that they don't appreciate what hemolysis means. Lindig, another who said the reaction was positive in other conditions than pregnancy, especially cancer, is taken to task by Abderhalden who says Lindig's errors are to be found in the use of a powdered placental preparation, the latter almost invariably giving a positive reaction, especially if kept for any time, the result apparently of some decomposition process which forms dialysable substances. Veit says

the test is a valuable one and brings up the point that the ectopic pregnancies do not react positively, probably because the chorionic cells are thrown off with the tubal abortion. Henkel, Sutman and McCord commended the test, McCord wth 240 cases and practically no failures. Abderhalden reports 200 cases with one failure. Jellinghaus and Losee report 563 cases, grouped according to the various stages of their technic, concluding that it is an accurate test for the presence or absence of chorionic cells still capable of being washed into the maternal circulation. Petri says it is amazingly accurate. Wolff describes his experiments, resulting in failure until he learned from Abderhalden himself the exact technic for preparing the placenta. He concludes that the method shows pregnancy in its very beginning and that the reaction is of special value for differential diagnosis between pregnancy and tumors. He says the test is not suited for general practice, but has great value in hospitals, where it can be performed often enough to ensure exact technic. Gambaroff reports from Moscow forty-eight cases of cancer and thirty-seven other cases in which the Abderhalden technic was applied, including twenty-two pregnant women and ten normal persons, the tabulated details showing remarkable concordance, constantly negative responses in the normal serum and constantly positive in all the others, with the single exception of a syphilitic who gave a positive cancer reaction. Judd says: "Some thirty or more of my own cases tested by this method have been quite in accord with the strict specificity of this test when putrefactive changes, fresh serum, and the proper selection of dialyzers have been carefully controlled." On the other hand, Heaney and Davis say a review of the literature and an experience with the test, together with the use of other means of testing the digestive activity of the blood, leads the authors to question the specificity of the test of Abderhalden; though since the need of such a reaction is great they urge that the test should be further tried and its results reported accurately. Schwarz suggests an error in technic to explain the failures. Echols says: "Fifty-seven tests were made according to Abderhalden's method; though the test will probably never be simple enough for the general practitioner to carry out, there is reason to believe that when done in properly equipped laboratories, Abderhalden's method will in the course of a year or so take its place with the Wassermann and Widal reactions in point of reliability." Ruhsamen reports ideal results in one hundred cases. Lichenstein, forty positive results in forty pregnancies, one positive result in thirty-four non-pregnant cases. Zoeppritz describes early failures, but with a mastery of technic perfect results in fifty cases. Engelhorn does not consider Abderhalden's dialysis method a specific reaction as a diagnosis cannot be reached by it, but there is some question of the accuracy of his technic. Mayer considers Abderhalden's pregnancy reaction a valuable aid to diagnosis. Schufer had two incorrect results in one hundred and twenty-three tests. Strange states that positive findings were obtained in 100% of the seventy-three women tested with Abderhalden's technic.

I am fortunate in being able to describe some results obtained here in Boston. These are from a series being prepared for a future report by Dr. W. H. Grant, the laboratory work being done by Dr. McCarthy of the pathological department of Tufts.

In twenty cases known pregnant, the first seventeen were positive by the Abderhalden technic, the last three negative, these accompanying difficulty with the dialysers. Eighteen cases clinically pregnant gave positive results in each case, four cases not pregnant gave four negative results. Besides these were twenty-eight tests in doubtful cases giving varying results, but which until sufficient time has elapsed to demonstrate the presence or absence of pregnancy, have no significance. The report of the completed series will be awaited with interest; in the meantime one is impressed by the concordance of the clinical and laboratory findings.

From a review of the literature one may draw several conclusions:

1. That the study of the bio-chemistry of the protective ferments is one destined to be of great importance in solving many of the hithertofore unexplained phenomena of health and disease.

2. That pregnancy aside from its local manifestations, evinces at least one general effort on the maternal organism similar to that evinced by pathological conditions, *i.e.* causing an invasion of the blood by elements foreign to it, and that there are developed in the blood substances to combat this invasion much in the same manner as the invasion of disease is combated, bearing out the tendency in evidence of late, to regard pregnancy as a pathological condition.

3. That although the Abderhalden test for the presence of the specific proteolytic ferment present in the blood of pregnant women is a difficult and extremely delicate one, a really surprising number of accurate results have been reported, especially surprising when considering that these reports are from a great number of widely separated and independent investigators, each of whom had to perfect his individual technic to a certain extent before it could be said that the theory and not his skill was being tested.

From which may be made the following deductions:

1. That the test is available where the services of a competent laboratory can be had.

2. That it is by far the most accurate method at our disposal for the diagnosis of pregnancy, comparing favorably as a test with the Widal and Wassermann reactions, in their respective fields.

3. That until some method is devised whereby the materials used, especially the prepared placental albumen, may be kept for some time

and in a more convenient form, and dependable dialysers more easily procurable, the test will not be generally available.

In this connection it may be mentioned that attempts are being made to simplify the technic so as to make it more generally available. Gutman, in a personal communication, expresses confidence that such a simplification can be accomplished, difficulty in procuring a special dialyser being the particular obstacle with which he is contending.

4. That it places in our hands a possible means whereby we may make a remarkably accurate diagnosis of the existence or non-existence of pregnancy, should the exigencies of any case demand a prompt determination of the fact.

BIBLIOGRAPHY.

Schmorl: Monatschr. f. Geburtsh. u. Gynäk., 1897, v. 46.
Kabanow: Münchener medizinische Wochenschrift, Sept. 30, lx, No. 39, pp. 2153-2208.
P. Lindig: Münchener medizinische Wochenschrift, Feb. 11, lx, No. 6, pp. 281-336.
T. Petri: Zentralblatt für Gynäkologie, Leipsic, Feb. 15, xxxvii, No. 7, pp. 225-256.
A. Fauser: Deutsche medizinische Wochenschrift, Berlin, Feb. 13, xxxix, No. 7, pp. 297-344.
A. E. Lampé; Papazolu, Z. Steizing: Münchener medizinische Wochenschrift, July 15, lx, No. 28, pp. 1529-1584.
J. Veit: Berliner klinische Wochenschrift, July 7, l, No. 27, pp. 1241-1284.
Ruhemann: Ztschr. f. physiol. Chem., 1913, lxxxv, 143.
Abderhalden, E., and Schmidt: Ztschr. f. physiol. Chem., 1911, lxxii, 37.
Abderhalden, E., and Lampé: Ztschr. f. physiol. Chem., 1912, lxxxi, 473.
R. Bundschuh and H. Roemer: Deutsche medizinische Wochenschrift, Berlin, Oct. 16, xxxix, No. 42, pp. 2025-2072.
F. Ebeler and Lohnberg: Berliner klinische Wochenschrift, Oct. 13, l, No. 41, pp. 1881-1928.
W. Rübsamen: Münchener medizinische Wochenschrift, May 27, lx, No. 21, pp. 1129-1184.
Judd, Charles C. W.: The Journal, June 21, 1913, p. 1947.
The Present Status of Abderhalden's Serodiagnosis: The Journal, Aug. 16, 1913, p. 493.
Heimann, F.: München. med. Wchnschr., April 29, 1913.
Behne: Zentralbl. f. Gynäk., April 26, 1913.
Abderhalden, E., and Freund, R.: München. med. Wchnschr., April 1, 1913.
Schlimper, H., and Hendry, J.: München. med. Wchnschr., May 17, 1913, p. 1586.
Williams, P. F. and Pearce, R. M.: Surg., Gynec. and Obst., April, 1913.
Veit, J.: Ztschr. f. Geburtsh. u. Gynäk., Dec. 21, 1912.
Abderhalden. E.: Serodiagnosis of Pregnancy, München. med. Wchnschr., June 11, 1912; München. med. Wchnschr., Feb. 25, 1913.
Freund, R., Abderhalden, E., and Lindig, P.: München. med. Wchnschr., April 1, 1913.
Engelhorn, E.: München. med. Wchnschr., March 18, 1913.
Ekler, R.: Wien. klin. Wchnschr., May 1, 1913.
Henkel, M.: Arch. f. Gynäk., Feb. 8, 1913.
Schwarz, Henry: The Journal, Aug. 16, 1913, p. 484; Interstate Med. Jour., May, 1913, p. 393; Interstate Med. Jour., March, 1913, p. 195.
A. E. Lampé, L. Papazolu, E. Frank, F. Rosenthal, and Lichtenstein: München. med. Wchnschr., July 1, lx, No. 26, pp. 1417-1472.
A. Sunde: Norsk Magazin for Largevidenskaben, Christiania, September, lxxiv, No. 9, pp. 1161-1304 and Supplement.
Tschudnowsky: München. medi. Wchnschr., October 14, lx, No. 41, pp. 2265-2320.
Frank and Heimann: Berl. klin. Wchnschr., Sept. 2, 1912.
Piorkowski: Berl. klin. Wchnschr., Feb. 17, 1913.
Abderhalden: München. med. Wchnschr., 1912, lix, No. 24 and 36; Deutsche med. Wchnschr., 1912, xxxviii, No. 46; München. med. Wchnschr., 1913, lx, 701.
Jaworski: Wien. klin. Wchnschr., 1913, xxvi, 922.
Stange: München. med. Wchnschr., 1913, lx, 1084.
Van Oye: Geneesk, Tydschr. v. Belgie., 1913, W, 148.
Bolaffio: Pathologica, Genova, 1912-13, v., 352.
Daunay: Comptes rend. Soc. de Biol., Paris, 1913, lxxiv, 1190.
Jonas: Deutsche med. Wchnschr., 1913, xxxix, 1099.
Kink: München. med. Wchnschr., 1913, lx, 1198.
Labbe: Rev. med. de Mormandie, 1913, 181.
Maccabruni: Arm de Ostet., 1913, l, 486, also München. med. Wchnschr., 1913, lx, 1259.
Parsamow: Zent. Gynäk., 1913, xxxvii, 934.
Rosenthal: Berl. klin. Wchnschr., 1913, l, 1149.
Schiffi: München. med. Wchnschr., 1913, lx, 1197.
Decio: Arm de ostet. (Milan), 1913, 1, 198.
Engelhorn: München. med. Wchnschr., 1913, lx, 587.
Zoeppritz: Deutsche Gesellsch. f. Gynäk., Halle, 1913, May.
Rübsamen: Deutsche Gesellsch. f. Gynäk., Halle, 1913, May.
Lichtenstein: Deutsche Gesellsch. f. Gynäk., Halle, 1913, May
Engelhorn: Zentralbl. f. Gynäk., 1913, xxxvii, 731.
Abderhalden, E.: Deutsche Gesellsch. f. Gynäk., Halle, 1913, May.
Mayer, A.: Deutsche Gesellsch. f. Gynäk., Halle, 1913, May.
Schafer, P.: Deutsche Gesellsch. f. Gynäk., Halle, 1913, May.
Gutman: Med. Rec., N. Y., 1913, lxxxiv, 99.
Jellinghaus and Losee: Bull. Lying-in Hospital, N. Y., 1912-13, ix, 68-96.
Pari: Gazz. osp., (Milan), 1913, xxxiv, 727.

THE EFFECT OF "606" ON THE EYE, WITH THE REPORT OF SEVEN CASES OF SERIOUS EYE COMPLICATIONS FOLLOWING ITS USE.*

BY P. S. MCADAMS, M.D., BOSTON.

Physician to the Eye Department of the Boston Dispensary.

WHEN Ehrlich first introduced his 606 there was a great fear in the minds of the ophthalmologists that the effects of the new preparation on the eye would be similar to that produced by other arsenical compounds such as atoxyl, arsacetin, and soamin, which had preceded it. All of these arsenic compounds had been claimed by their introducers to be harmless to the eye, but further experience proved this not to be the case. Quite a large number of cases of blindness were reported to have followed their use. Of these preparations, the one most largely used was atoxyl, an empirical, synthetical arsenic compound, which came into use in the treatment of sleeping sickness and was used to a considerable extent in the treatment of syphilis. Although, claimed at first to be innocuous to the eye, from a study of the literature for 1908, 1909, and 1910,—the years during which it was chiefly used,—I have been able to find over 100 cases of complete blindness and a large number of cases of partial blindness resulting from its administration. The ocular manifestations following its use always assumed the character of a primary optic atrophy. It was essentially a degenerative process affecting either the ganglion cells of the retina or the fibres of the optic nerve, somewhat similar to the condition produced by other toxic substances, such as methyl alcohol, quinine, and other toxic substances. Both eyes are invariably affected. The blindness may come on suddenly or gradually, but once the lesion is produced, it remains stationary or slowly progresses until more or less complete blindness results. A partial recovery occasionally occurs if the drug is withdrawn early enough. The condition is not improved by any treatment, and a second injection of atoxyl never improves vision, but causes a more profoundly injurious effect. With the ophthalmoscope the picture is seen to be one of simple optic atrophy.

The attitude of the ophthalmologists towards 606 was well expressed by Henderson, of St.

* Read at the October, 1913, Clinical meeting of the Staff of the Boston Dispensary.

Louis, who, in an article on the effects of atoxyl, in the *American Journal of Ophthalmology,* for November, 1910, says in his concluding paragraph: "The subject is worthy of careful consideration in view of the approaching distribution of 606. If I am correctly informed, this, too, is a synthetic preparation of arsenic. The world-wide publicity already given to the achievements of this remedy will result in its more or less indiscriminate use by every physician who can get it. In accepting and using this potent remedy we must not forget that all of its predecessors were for a time considered harmless in their action upon the visual apparatus by authorities in whom we had every right to repose the greatest confidence."

The important questions which the ophthalmologist wished to have answered were: (1) Is arsenobenzol innocuous to the healthy eye, especially the healthy optic nerve? (2) Can it be used when the nerve is inflamed? (3) Is it a safe and efficient remedy in the treatment of syphilitic disease of the eye itself?

Serious disturbances of the visual apparatus certainly do follow the administration of arsenobenzol in a certain number of cases, but when one considers the tremendous number of patients that have received it, the number of ocular disturbances following its use are small as compared with atoxyl and its allied drugs. An examination of the literature during the past three years shows that most authorities believe that the eye lesions following 606 are to be considered as relapses of syphilitic disease, and not a consequence of the arsenobenzol. There are still a few, however, who maintain that it is a menace to the eye and should be used only in special conditions. Ehrlich himself, in view of the bad results to the eye following atoxyl, advised caution in the use of his preparation and advised a careful examination of the eye before injection. Later, however, when he had received reports of a large number of cases without untoward effect upon the nerve, except in one case, he claimed that 606 was without detrimental effect upon the eye. He also deplored the fact that ophthalmologists were not making sufficient use of his preparation in syphilitic diseases of the eye. In defending the use of 606 against the charge that it was not without danger to the eye, in the *Wien. Klin. Rundschau* of Jan. 29, 1911, he states that disturbances of the optic nerve in recent cases of syphilis are found, not only after the use of salvarsan, but also after the use of Hg. On the other hand, when sufficiently large doses of salvarsan were used, such affections were never seen. The use of atoxyl and arsacetin show that the toxic symptoms increase with the amount of the dose injected. The optic nerve affected after salvarsan improves under antisyphilitic treatment, and sometimes it is cured by another injection of salvarsan. An affection of the nerve caused by atoxyl could never be cured by an additional injection with an arsenical preparation. Numerous other authors support the contention of Ehrlich that arsenobenzol is innocuous to the healthy eye, and the ocular lesions following its administration should be considered as manifestations of syphilis. Wechselmann and Selligshon of Berlin gave the injections in 1400 cases of their own, and collected reports from approximately 20,000. Of these cases, none showed any harmful effect upon the optic nerve. At first they excluded from the treatment any cases showing inflammation of the nerve, but later, after they had given the injection to several doubtful cases, that is, cases where it was impossible to say whether the nerve was inflamed, or not, without deleterious effect, they used it in several cases of outspoken optic nerve affection, with the result that the condition of the inflamed nerve was considerably improved, and in some cases cured. From this they conclude that 606 may be given with favorable results, even when optic neuritis exists. This opinion is confirmed by the experience of most writers. They also gave the remedy in a number of cases of primary optic atrophy, on which it had no apparent effect, either beneficial or otherwise. This, however, is quite contrary to the experience of others. Most authors agree that the effect of the 606 on the atrophic nerve is detrimental, that it causes a more rapid degeneration of the nerve, and that atrophy of the nerve should be considered a contra-indication for the administration of the drug.

A comparison of the lesion resulting after atoxyl with that following 606 will aid, I think, in determining whether the ocular lesions after 606 are due to the arsenobenzol or not. In atoxyl poisoning the lesion is essentially a degenerative one, resulting in an optic atrophy very similar to the condition produced by other toxic substances, whereas the lesion following 606 is an acute inflammatory one. Usually four to eight weeks, or even longer, after an injection of 606 the patient notices a sudden dimness of vision, which becomes rapidly worse. With the ophthalmoscope the vitreous will be found to contain a greater or less number of opacities which at times are so profuse as to prevent a clear view of the fundus. The disk, if it can be seen, is red and veiled, may be swollen, and the blood vessels, especially the veins, dilated and tortuous; scattered through the fundus will be found inflammatory exudates in the retina and choroid, often accompanied by hemorrhages. These are precisely the sort of lesions which appear in syphilitic disease of these structures and form a picture diametrically opposite to that found in atoxyl and allied poisoning. But one eye usually is affected,—although both may be. In atoxyl poisoning both eyes are invariably affected. Antisyphilitic treatment, or another injection of the 606, will usually improve and sometimes clear up the condition. After atoxyl no treatment benefits, and a further injection of atoxyl causes a

more profoundly injurious effect. Moreover, the late appearance of the lesion after the injection of the 606 seems to me to have a bearing upon the question of its causation. Usually it is a matter of weeks, or even months, after the injection before the ocular symptoms appear. As we know, the arsenic is rapidly excreted from the system,—usually after three to four days but few traces can be found,—and it seems to me that if toxic symptoms were to be produced they would be found shortly after the injection, while the organism was still under the influence of the arsenic.

Iritis, retino-chorioditis, optic neuritis, and ocular palsies from affection of the third, fourth and sixth nerves, as well as affection of the fifth nerve, have followed the use of salvarsan in a certain number of cases. Davids reports a case which had bilateral iritis following an intramuscular injection. Two weeks later a relapse occurred in one eye, which rapidly subsided after an intravenous injection. Van Lint reports two cases of iritis treated with salvarsan. Iritis was reproduced in the same eye after the injection. DuJardin and DeNeux have observed in two cases of secondary syphilis recently injected commencing optic neuritis, paresis of the superior oblique muscle and paralysis of the oculomotor, with beginning papillitis. They think that these conditions have a bearing on the administration of 606, but do not think it is a purely toxic action. They believe there exists a relationship between the modified syphilis and the action of arsenobenzol, causing a disturbance in the evolution of the disease. Shanz reports two cases of optic neuritis following the injection of salvarsan, which were cured by a repetition of the injection. We have had one case of affection of the fifth nerve following 606 at the Dispensary. There was anesthesia of the cornea and the right side of the forehead and the face. The lesions in the eye itself may be considered as syphiliomata produced by the immigration of the spirochetes which have been freed by the softening of foci by the injections. They are analogous to the tubercular metastases observed after the injection of tuberculin. It must be remembered that the nerves pass through narrow channels of bone lined with a tough connective tissue, which, as places of predilection for nests of spirochaetes, escape the therapeutic action of the 606. Some explain these apparent relapses as an endotoxin action, the endotoxins having been set free from the dead spirochaetes.

The relapses following 606 were much more frequent in the early days of its use, when there was more or less uncertainty in regard to the size of the dose, and the hope was entertained that it was the *therapia sterilans magna*, which would cure by a single injection. As a result, the amount given was too small to kill all of the spirochaetes, and those not destroyed were later able to cause relapses of the disease in various tissues. Moreover, it is held by some authorities that small doses have a provocative or irritative effect. According to Ehrlich, in such cases the parasites are not killed, the dose being too small, but irritated and in this condition produce greater quantities of toxins. At any rate, during the past year, during which the drug has been administered much more energetically, relapses in the eye have not been so frequent.

It has been the custom at the Dispensary to refer those cases which were to receive 606 to the eye room for examination, especially with reference to the condition of the optic nerve and the fundus. A report is returned, giving the vision of each eye and the condition of the fundus and optic disk. If the vision of either eye is below normal, the reason for the same, refractive error or otherwise, is stated. A record of the same is kept both in the skin room and in the eye room. We thus have an exact knowledge of the condition of the eye before the injection of salvarsan, and if a deterioration of vision should occur subsequently the case is referred again to the eye room for examination as to its cause.

During the past year, from July 1, 1912, to July 1, 1913, arsenobenzol has been administered, by a coincidence, 606 times. We have the records of four cases in which disturbances of vision followed the injection during this period. In addition to these four there were three other cases which received the injection just previous to July 1, 1912, but whose eye symptoms appeared or were treated after July 1, and these we have included in this group. It will thus be seen that but two-thirds of one per cent. of the cases receiving the injection show disturbances of the eye afterwards.

Of these seven cases, six showed serious lesions of the deeper structures of the eye, and in four of these practical blindness has resulted. In one case the relapse showed itself as an iritis, which readily improved after a second injection of arsenobenzol. In analyzing these cases, the important data are:—

1. The date of the injection.
2. The date of the onset of symptoms.
3. The character of the lesions in the eye; and
4. The result of treatment and prognosis;

and it is with a view to these headings that I wish briefly to describe these cases:

CASE 1. Man, 41 years of age.

(1) *Date of Injection of* 606. First injection Sept. 7, 1811. Second injection, February 20, 1912. Both eyes normal.

(2) *Date of Onset of Symptoms.* April 16, 1912, over six weeks after injection. Vision of right eye = 10/200.

(3) *Character of Lesion.* Numerous opacities of vitreous, disk blurred and veiled, several hemorrhages and exudates in chorioid and retina.

(4) *Treatment and Result.* In spite of energetic antisyphilitic treatment vision rapidly failed. At last examination, Sept. 26, 1913, vision = could

count fingers in temporal field. With the ophthalmoscope, vitreous opacities still present but not nearly so numerous, hemorrhage on disk—atrophic patches through fundus.

CASE 2. Man, 27 years of age.
(1) *Date of Injection.* June 5, 1912. Eye normal.
(2) *Date of Onset of Symptoms.* Six weeks later noticed blurring of vision of left eye—vision = 20/80.
(3) *Character of Lesion.* Dust-like opacities of vitreous, disk swollen and red, veins engorged and tortuous—exudate in chorioid and retina.
(4) *Treatment and Result.* Intramuscular injections of mercury. Vision failed rapidly for a month at which time V = 4/200. Went to New York, treated there by a physician with pills and drops. Vision improved somewhat until last March when there was sudden loss of vision—no treatment since. Seen Sept. 16, 1913, when V = light perception. Received 606 again September 19,—two days later some improvement. Last seen September 30, V = hand movements at 2 m. Examination with ophthalmoscope shows massive exudates in vitreous obscuring all details of fundus.

CASE 3. Young woman. Grace G. 22 years. Referred to eye room for specific iritis of right eye on June 20, 1912.
(1) *Date of Injection.* June 26, 1912. Vision of OD = 20/40. Vision of OS = 20/20. Fundus O.K. Iritis rapidly improved.
(2) *Date of Onset of Symptoms.* Six weeks later right eye became affected. Seven weeks later left eye became affected.
(3) *Character of Lesion.* Opacities of vitreous in both eyes—disks red and blurred.
(4) *Treatment and Result.* In spite of most vigorous antisyphilitic treatment together with pilocarpine sweats and subconj. injection of Dionin 10%, her vision rapidly grew worse and at the end of four months she had to be led to the dispensary for treatment. On Jan. 13, 1913, about five months after onset of symptoms, her lids became enormously swollen, red, tender and indurated so that she was unable to open them. A tense, tender swelling could be felt along the upper edge of orbit on both sides = orbital periostitis. Vision = hand movement. Later showed syphilitic nodule on sclera. Under vigorous specific treatment with pilocarpine sweats gradually improved in course of next few months. Vou = 20/40, July 12, 1913. Last seen September 23, 1913. Vitreous quite clear; few atrophic spots in fundus. On posterior surface of cornea deposits of inflammatory exudate. V OD = 20/100, V OS = 20/70.

CASE 4. Man, 23 years of age.
(1) *Date of Injection.* July 24, 1912. Eyes normal.
(2) *Date of Symptoms.* Two weeks later pain and redness of left eye.
(3) *Character of Lesion.* Iritis with posterior synechia.
(4) *Treatment and Result.* Received a second injection of 606 on August 28. Rapid improvement.

CASE 5. Man, 42 years of age.
(1) *Date of Injection.* August 20, 1912. Eyes normal.
(2) *Date of Symptoms.* Seven weeks later vision of left eye failing. Vision = light perception only.
(3) *Character of Lesion.* Vitreous so smoky that details of fundus could not be made out. Three weeks later developed an iritis.
(4) *Treatment and Result.* Iritis improved rapidly under local treatment—atropine. Condition of vitreous remained practically the same in spite of antisyphilitic treatment. Saw him last on January 10, 1913. Vision very slightly improved. Could count fingers with OS. With opthalmoscope condition of vitreous practically the same.

CASE 6. Man, age 27 years.
(1) *Date of Injection.* Oct. 9, 1912. Vision and fundus normal.
(2) *Date of Symptoms.* March 26, 1913, five months later, V OD = 20/50. Could not state just when symptoms began but quite recently.
(3) *Character of Lesion.* Large vitreous opacities—disk red and veiled. Fundus indistinct.
(4) *Treatment and Result.* Received injection of 606 without any apparent improvement. Specific treatment. Last examined May 31, 1913. V OD = 20/70. Fundus indistinct—numerous floating opacities of vitreous.

CASE 7. Woman, Sarah B. Age 29.
(1) *Date of Injection.* February 12, 1913. Eyes normal.
(2) *Date of Symptoms.* Six weeks later, on March 26, 1913, returned saying vision of left eye had become dim several days before. V. OS = 20/120.
(3) *Character of Lesion.* Some haziness of vitreous. Disk red and blurred—retino-choriodities in macula.
(4) *Treatment and Result.* Three days later showed beginning iritis. Specific treatment. Condition grew worse. April 2 received second injection 606, no improvement. April 17 vision = 7/200. Improvement from this time on. July 8 vision = 20/50. Last seen September 30, 1913. Vitreous clear. Few glistening spots in macula and other parts of fundus. Disk O.K. Vision = 20/30.

In analyzing these cases, the first point that strikes one is the length of time that elapsed between the time of the injection and the onset of the eye symptoms. In every one of the cases involving the deeper structures of the eye a period of at least five to six weeks elapsed before the onset of the symptoms. Surely all the arsenic had been eliminated from the system by this time. The second most striking feature is the severity of the eye lesions. In four out of six of the cases in which the deeper structures of the eye were involved practically complete blindness resulted. None responded to the ordinary anti-specific treatment. This is not in accordance with the views expressed by others who say that lesions following 606 are usually improved by specific treatment. In both of the other cases the vision was impaired, in one quite severely, a vision of 20-70 resulting. While I believe that in all of these cases the effects were due to the disease and not to the drug, it tends to prove that the character of the disease is changed, that its virulence is increased. This would support the contention of those who believe that insufficient doses have a provocative

or irritating effect. A third point is that these relapses are not occurring as frequently now as formerly. Since the first of the present year we have had but one case, that of Sarah B., who received her injection Feb. 12, and developed her neuro-retinitis March 26. Moreover, this is the only one in which the symptoms were less severe and the only one whose vision was restored to practically normal. May this not be the result of more energetic treatment with salvarsan?

While of course the number of cases that we have had in the Dispensary is too small to permit us to make any too broad or too positive statements in regard to the effects of arsenobenzol, yet I feel this way about it. If, as most authorities claim, these ocular lesions following 606 are simply the manifestations of syphilis, and if, as it is declared, arsenobenzol has such a remarkable beneficial effect in clearing up the symptoms of syphilis, then I believe that in all of these cases of ocular relapses the injection should be repeated, and that as soon as the symptoms appear. There is no organ in which irreparable damage to the delicate tissues can result more quickly from an inflammatory process than in the eye. Treatment after the damage has been done will not restore the destroyed nerve or other tissue. If the relapsing lesion affected the mucous membrane of the throat or the skin, one would not hesitate to give 606 any number of times it was deemed necessary to eradicate the disease. Then why not if the symptoms happen to affect the eye?

As regards the therapeutic effect of 606 in syphilitic disease of the eye, there is no unanimity of opinion as to the curative effect of the new product in ocular disease. In interstitial keratitis of inherited syphilis, for which mercury is well nigh useless, salvarsan has, on the whole, given no better results. A few men have reported good results, but the majority think the malady little influenced by it. The relief of the photophobia is generally attributed to it. This has been our experience at the Dispensary. In two of the cases, both boys, aged twelve and thirteen, respectively, one of whom received two injections at intervals of two months, the other four injections at intervals of two weeks, I think the course of the disease was shortened somewhat. In both the corneae were quite clear and glancing after three months' treatment. Usually it requires anywhere from four or six months' to one or two years' treatment. Most of the men who have reported favorable results have given the injection several times.

Iritis and iridocyclitis of secondary syphilis, usually respond well to the drug and much more quickly than to mercury. Improvement can frequently be found on the day after the injection. In four cases treated at the Dispensary, improvement was rapid, with apparent cure in about ten days, whereas under ordinary circumstances it requires three to six weeks for complete cure. The eye showed improvement within a few days after the injection. Such rapid improvement is to be expected in such a vascular tissue where the drug can come quickly into contact with the causative factor.

As far as the optic nerve is concerned when optic neuritis exists as a result of syphilitic inflammation, most authors maintain that the injection of 606 has a most rapid and beneficial effect. Shanz, Wechselman and Selligsohn have reported cases of optic neuritis in which arsenobenzol was used with most favorable results. In three cases of papillitis reported by Shanz, improvement was noticed on the same day as the injection. In two cases of optic neuritis treated by injection at the Dispensary the improvement was marked inside of a week. When simple primary atrophy of the nerve exists the consensus of opinion is that no benefit can result from 606. In fact, the atrophic process seems to be unfavorably influenced by the drug. This seems to be the sole contra-indication for 606 in specific diseases of the eye. Some writers also maintain that no benefit results from the use of 606 in ocular paralysis. This has not been our experience in one case seen at the Dispensary. The patient, a woman 49 years of age, with specific history of twenty years' duration, was referred to the eye room on June 20, 1913, with a ptosis of the right lid, which had started one week previous. Examination showed complete ptosis of right eye, paralysis of internal, superior and inferior recti muscles. She received 606 on July 16; six days later all paralyses were very much improved. Ptosis had entirely disappeared and movements of the eye were almost normal.

Summing up the effects of 606 on the eye, I should say that no case of injury to the healthy eye has been proven. The consensus of opinion is that it is innocuous to the healthy eye. A favorable result from the application of this drug is to be expected in syphilitic disease of the iris, the chorioid and retina, and the optic nerve, in paralysis of the ocular muscles, due to syphilis, and sometimes in interstitial keratitis. As far as we can judge in the short time salvarsan has been in use, it must be welcomed as an effective specific remedy in syphilis of the eye, which seems especially indicated in cases in which speedy aid is urgent. It is not a panacea for ocular syphilis which can entirely replace our usual specific preparations. It is especially indicated when a speedy action is desired, as in primary ocular affections, or in secondary or tertiary symptoms, if a rapid impairment of function is dreaded.

ASSOCIATION OF AMERICAN MEDICAL COLLEGES.—The twenty-fourth annual meeting of the Association of American Medical Colleges was held in Chicago on Feb. 25. Five topics of medical education were discussed at the morning session; and in the afternoon there was a symposium on clinical teaching, and an address by the president, Dr. E. P. Lyon, of Minnesota, on "The Principles of Curriculum Making."

THE EARLY DIAGNOSIS AND TREATMENT OF DEMENTIA PRECOX.

By Edward Mellus, M.D., West Newton, Mass.

Our insane hospitals are full to overflowing, and notwithstanding the fact that we are adding each year to their capacity, the yearly increase in the numbers requiring care is so great that the problem of housing our growing population of insane is a tremendous one.

There are many reasons for this great increase in numbers. One of the most important is that the general public has come to feel, in spite of frequently recurring sensational charges of brutality, that the hospitals for the insane can and do care for their inmates humanely. This has resulted in the commitment in recent years of very large numbers of cases of senile dementia, filling the infirmary wards with feeble bed patients who require a great deal of nursing, and severely taxing the capacity of the hospitals.

But these senile cases, many of whom are only technically insane, showing only the expected breakdown of advancing years, have a fairly short expectation of life, and are continually making room for other patients. There is another class of patients, however, who come under the care of our institutions at an early age, and as their form of mental disease tends toward becoming chronic, without any necessary impairment of their physical health, their accumulation fills our wards with hopeless mental wrecks. I refer to cases of dementia precox. It is a fact, which need not be discussed, that the earlier a disease is diagnosed, and given proper treatment, the better is the prognosis. In the case of mental diseases, this holds true, as well as in other abnormal conditions. Yet, as a rule, patients who are suffering from a mental breakdown are not seen by physicians who have had experience in that line of work, until the disease is so far advanced that treatment in a hospital for the insane is sought as a last resort. Men who make a specialty of mental diseases do not often see their patients until the mental symptoms are quite pronounced, and it thus becomes necessary that the general practitioner should recognize the incipient stages of insanity, if we wish to make a great advance in its treatment.

I have already referred to two forms of mental disease commonly seen in the insane hospitals. If to the cases of senile dementia and dementia precox, we add those of manic-depressive insanity and general paralysis of the insane, or dementia paralytica, we will find that we have given the diagnosis of a very large percentage of our insane patients.

In manic-depressive insanity the prognosis is good, almost without regard to treatment. Although the disease is essentially a recurrent one, the patient will generally recover from the present attack, and it is a question how much that attack can be shortened by treatment.

General paralysis is a mental and physical disease, the mental symptoms usually being marked delusions of grandeur, followed by extreme dementia and death. This disease is so generally preceded by syphilis that by many of the most noted psychiatrists it is claimed that syphilis is always present in the etiology. The prognosis is invariably bad, and so far as the patient and his family are concerned, the fact that the average duration before death is only about two years, is a consoling feature.

Senile dementia is too common an ending for those unfortunate enough to outlive their usefulness, to need description.

I have dismissed these three large groups of cases thus summarily for two reasons. They are well known, and are not apt to go long undiscovered. Then, too, early treatment makes very little difference in the result; they get well or they die. On the other hand, I feel that an early diagnosis of dementia precox is much more essential in the light of the ultimate prognosis as influenced by early treatment. The prognosis in this disease is usually considered poor. I remember, not long since, when one of our state hospitals was severely criticised for including in its statistics a recovery in a patient diagnosed as dementia precox. This is no longer the case, though there are still some who insist that if there is a recovery, the diagnosis of dementia precox must have been an error.

In many physical diseases, we are familiar with certain well known prodromal symptoms, whose appearance causes us to take immediate steps for the safety of the patient or those about him. In dementia precox we often learn, when it is too late, that the patient has, for a long time, shown symptoms that should have been interpreted as danger signals. Unfortunately these signs are not heeded, for they are displayed only before parents and relatives, who are too blind to see them.

There is probably no form of mental disease where heredity plays such a tremendous part in the etiology as in dementia precox. I do not mean that you should expect always to find a history of insanity in the parents, but rarely will a case be found without some mental or neurotic taint in the family. The parents are very often eccentric, to say the least, and it is not to be wondered at that their prejudiced eyes should see nothing abnormal in their children, until it is apparent to everyone else. If, then, the parents cannot be expected to discover the early signs of an oncoming dementia precox, it is very necessary that the only ones left who have a close intimate relationship to the child, the family physician and the teacher, should be thoroughly familiar with the symptoms.

Kraepelin states that at least 70% of dementia precox cases show hereditary factors in the etiology, but that only 17 or 18% is found in

direct ancestry. A careful analysis of histories, however, would lead us to place this latter estimate much higher. We often find in the history of the parents that the home surroundings were not comfortable, that one or both parents were unable to adapt themselves to commonsense relations, or that the father, for example, had not made a success of life. Many of these cases of marital incompatibility, and of the unambitious, unsuccessful drones, were very probably mild cases of dementia precox themselves, or the results of the same disease, with partial recovery.

When we consider that heredity is so important in the etiology (in fact Clouston insists that heredity is always present), we should be prepared to find that there is a distinct type of personality that seems predisposed to this form of mental disease. This is the case, and August Hoch has given this type a name which is very apt, the "shut-in personality." Jelliffe, in an article on pre-dementia precox, describes this so well, that I will quote a passage:—

"My own observations of patients whom I have known intimately since childhood have shown that the paranoid dement in particular has been rather abnormally brilliant, but with the lights turned inward rather than outward. They were extremely unpractical in the use of their hands, or in any adaptation to material ends. They were utterly unable to observe with accuracy anything physical or material, for their minds were constantly turned in upon their own meditations. They were all unready to adapt themselves to uncongenial environment. . . They were subject to fits of abstraction, when they would not hear or see what would attract a normal youth. They were usually irritable to their families, but most desirous of being thought either amiable or brilliant by strangers. They were abnormally sensitive and suspicious, and most were prone to discuss deep, unsolvable questions."

It can scarcely be claimed that all such children as have just been described are really partially developed cases of dementia precox, but there is very little doubt that in such children we have a very fertile field for the development of the disease. If physicians would bear in mind that such children, especially where there is a known hereditary taint in the family, are in danger, and would take steps to prevent further development, a tremendous amount of good could be done.

You may easily imagine from this that dementia precox is a disease of childhood, and though that is essentially true, many cases show the first symptoms much later. The fact that in a large percentage, however, the trouble first appears at or about the age of puberty or of adolescence, and in many other instances during pregnancy or the menopause, has led many psychiatrists to contend that it is in reality a product of auto-intoxication, probably caused by some internal secretion of the testicle or ovary. Considerable investigation is being done in this line, and more light may be shed on the etiology.

The onset of the typical symptoms of the disease is very gradual, and though cases of an abrupt onset are reported, it is very seldom that such are substantiated by careful investigation. Loss of ambition, indifference, sudden and unaccountable fits of temper, suspiciousness, and a desire to be left alone by former friends and companions,—all of these are typical symptoms of beginning dementia precox. Inability to concentrate the attention, lack of judgment and the habit of shifting from one line of work to another, are other symptoms. If there are delusions, though these are not usually among the early symptoms observed, they are apt to be especially noticeable because they are silly. I will not attempt to describe the later symptoms, such as peculiar mannerisms, negativism, mutism, stereotypy, cataleptic conditions, etc., for they only appear when the disease is so far advanced that, as a rule, the patient has already been committed to an insane hospital.

A short account of a patient formerly under my observation will give an illustration of a fairly typical case of dementia precox:—

In this case there was a very marked insane heredity. The father is strong physically, but admits that he is very nervous. The mother was a patient at McLean, twenty years ago, and is at present a woman of very poor judgment and very emotional. She has recently had a nervous breakdown and went for treatment to a private sanitarium. A sister of the mother is at McLean, where she has been for some years. Another sister has been at McLean. A third sister who is in the West, has broken down mentally. A brother was never in any institution but was admittedly unbalanced. The patient's maternal grandfather died of apoplexy and his maternal grandmother had melancholia and died of paralysis.

On the father's side, the history was nearly as bad. An aunt is now a patient at Worcester, while his grandfather committed suicide and his grandmother died of tuberculosis. There is probably even more hereditary taint in the family history, as even this much was only admitted after very close questioning.

The patient himself was delicate as a child and very nervous. He had a strong temper and a stubborn will. He did what he wished and would take advice from no one. He seldom played with other boys, but spent his time working with machinery and electrical appliances. He was fond of music and became very proficient instrumentally. He liked school also, and as he was bright in his studies, was encouraged in this line and went to college, where he graduated with honors. While at college he kept up his music and took work at the Conservatory of Music. He neglected his own comforts, was very irregular about his meals and often did not get sufficient sleep.

After leaving college, he tried several pursuits but never kept at one thing for any length of time. He tried life insurance work, was for a time in a banking office, dropped his work entirely and read German for a few months, formed an orchestra of which

he was the leader, and worked for a time with the men destroying gypsy moths. He enlisted in the navy as a musician but soon disappeared. He was later found working in a machine shop and was arrested as a deserter. He was discharged from the navy because of his mental condition and was committed.

In this case, I believe that much could have been done to prevent his breakdown if he could have been properly held back and not allowed to have his own way in everything. Of course, with a family with such a taint, it is impossible to expect that proper judgment would be used in bringing up such a precocious child, and perhaps the only possible prophylactic measure would have been the prevention of the marriage of two such neuropathic parents.

The fault has been found with most of the text-books on mental diseases, that they go into great detail concerning the etiology, pathology and symptomatology, but are very unsatisfactory in their recommendations for treatment. This is particularly true when the disease in question is dementia precox. White, at the head of the Government Hospital for the Insane, at Washington, whose "Outlines of Psychiatry" is used as a text-book in many of our schools, says, "These cases will, of necessity, have to spend most of their lives in a hospital. It is, therefore, desirable to educate them as early as possible in good habits. They should be encouraged to some form of education, preferably out of doors. Under the influence of hospital surroundings and farm life these cases may get on very comfortably and the dementing process be considerably retarded." This is all he has to say about treatment, with the exception of advising the correction of any functional abnormalities.

The text-books, however, are written as a rule by hospital men, and as they seldom see cases of dementia precox until they are fairly well advanced toward the hopeless later stages, it is not to be wondered at that their views are so pessimistic. If we are treating a case of yellow fever and do not begin treatment until the appearance of black vomit, about all we can do is to arrange for digging the grave.

Let me quote once more from White: "It is to be hoped that some day we shall have a sufficient understanding of character to be able to pick out those types liable to develop psychoses and to protect them from that class of stresses that they are least able to withstand. At present we can hardly be said to approximate to this. The neurotic child, however, can be recognized, and should be safeguarded, especially throughout school life and the period of puberty and adolescence. Some day, perhaps, competent advice will be sought by parents as to the best methods to be employed in the rearing of their children. Until then we are largely helpless in the matter of prevention."

Here is the point that I want especially to emphasize. The man in general practice is the one who can do this best. Those of us who are specializing in this work must keep in closer touch with the general practitioner and encourage him to discover these cases early and begin treatment before irreparable damage is done. These same men in general practice, commit patients to our insane hospitals, but how many of them ever visit the hospital to follow and watch the patients they send there? Perhaps they feel they would be intruders, but I am sure they would be welcomed at any of our hospitals.

Children, whose parents or family have a marked neurotic taint, especially if they show signs of precocious brilliancy, should be closely watched and kept from unnecessary stress. In school they should be held back, and not encouraged by ambitious teachers and admiring parents to outstrip their comrades. Instead, they should be compelled to keep out of doors and enter into games with other children. Bashful little "shut-ins" should be coaxed out of their shells and encouraged to make friends. Those who show especial aptitude for music or art, should not be allowed to spend too much time with these studies at the expense of other necessary, though more prosaic pursuits, for it must be remembered that there is a very thin partition between genius and mental trouble. The child's environment should be noticed. If, as is often the case, it is an only child, it is often well to advise a boarding school, for with all the well-known disadavantages, the close association with other children is better than being too much with "grown-ups."

One other way in which the general practitioner can do yeoman service, is by advising against marriage in every case where it is feared that some neurotic taint might be transmitted to future generations. We are not justified in saying "Marry if you wish, but don't have children." Many a marriage has been unhappy because of an unsatisfied yearning for children. Advice on this subject from the family physician is much more often followed now than formerly, largely owing to the campaign of education carried on by such organizations as the National Committee for Mental Hygiene.

While on the subject of treatment, I wish to make brief mention of the latest development in the treatment of mental diseases. Probably for the very reason that writers on insanity have so little to suggest in the way of treatment, they are apt to follow any new fad that offers hope. The latest fad is psychanalysis, and though it undoubtedly has much of good in it, especially in the treatment of hysteria and neurasthenia, I am much opposed to its use in cases of dementia precox. Without going into its sexual aspect, which repels many of us, it seems to me that dementia precox patients are all too introspective anyway, without any further encouragement. Personally, I have seen this treatment used on only one case of dementia precox, and the apparent results were very bad.

As I said early in this paper, the prognosis in dementia precox is considered bad. However,

recently, numerous recoveries have been reported. Many of these have been for private hospitals, as is to be expected, for they have the advantage of receiving patients early, before the family would be willing even to think of a state hospital. Many of these recoveries would probably show some deterioration on careful examination, but if they are able to return to their homes and lead useful lives, why are they not just as properly classed as recoveries as cases of manic-depressive insanity when the expected usually happens, one or many recurrences.

DIABETES AND SURGICAL OPERATIONS.

BY CHARLES GREENE CUMSTON, M.D.,

Privat-docent at the Faculty of Medicine; Fellow of the American College of Surgeons; Honorary Member of the Surgical Society of Belgium, etc., Geneva, Switzerland.

IT is at present an acquired fact, that diabetics may be submitted to operations of vast import with a successful outcome. To give a general idea as to what can be accomplished I will cite a few cases at random. Chavannaz has operated on five diabetics with one death. These cases were a laryngeal carcinoma, death eight days later; malignant disease of both ovaries, cure; castration for orchiepididymitis, cure; two amputations at the thigh, cure by first intention. Caralp (*Thesis*, Bordeaux, 1912) records one amputation of breast by Willy Meyer's method for an ulcerated carcinoma of breast, cure; three amputations at thigh for diabetic gangrene, all recovered; two hysterectomies for fibroid, both recovered; one palliative curettement for cancer of cervix uteri, cure; five trepanations for mastoiditis, with two deaths. The fatal cases were due, in one to old age, the patient being 76 years old; the other presented acetone in the urine. Richard operated on a buccal cancer successfully, Redard an epulis, Israel several cases of renal cancer and a suprapubic cystotomy, without any deaths. To these cases I may add six of my own, namely, one amputation at thigh for diabetic gangrene, death; one suprapubic prostatectomy, recovery; one strangulated hernia, and one amputation of the great toe and excision of two carbuncles, all successful.

Now, although diabetics are operable, the chances of success are naturally the greater when they have been first submitted to an antidiabetic diet in order to reduce as much as possible the glycosuria. This diet should be followed until the patellar reflex has returned, if it was found absent. The treatment should be very minute in all details, although it must be admitted that operation has been successful in instances in which time has not permitted a long period of diet and antidiabetic treatment. It goes without saying, that when the operation is not urgently indicated one should carefully prepare the patient, selecting either Bouchardat's or Cantani's regimen as being the most rigorous.

My cases were submitted to a diet of broiled meat, potato and gluten bread, with the administration of bicarbonate of soda and Vichy water. Antipyrine and lithium carbonate are also of value. The present-day diet generally employed seems to be roasted or broiled meats, purée of green vegetables and gluten bread. This regimen is advantageous, inasmuch as it diminishes the hyperglycemia. Alkalines particularly favor oxidation of organic substances and by their use the urine becomes less dense and less acid, the urea increases in amount, while the uric acid and albumin decrease, likewise the amount of sugar present.

The drugs resorted to as antidiabetic are more for the purpose of reducing the glycosuria than the hyperglycemia. Opium checks the thirst, diminishes the hunger and limits the glycosuria. It may be given in the form of Dover's powder, morphine or codeine combined with belladonna. In debilitated patients strychnine is useful, or when there is a diminution of sight or atony of the digestive functions. Valerian and arsenic act on the metabolism. The former drug has a favorable action on the polyuria and polydypsia, it also decreases the urea. Arsenic acts as a vascular tonic and influences metabolism, but its results are, on the whole, doubtful. In moderate doses, glycerine may counteract the loss of flesh. Ricord, long ago, prescribed iodine in sudden recurrence of diabetes, while the tincture of iodine, 5 to 20 drops at meals, has been given by Bérenger-Férand, and the syrup of the iodide of iron by Bouchardat.

Various acids have been prescribed, such as carbolic, nitric, salicylic and phosphoric, likewise, sodium salicylate, chloral, cocaine; astringents, like alum, tannin, etc.; oxidants, such as potassium chlorate or permanganate, inhalations of oxygen, etc. Antipyrine has given remarkable results, but as soon as it is stopped the sugar returns in the urine. The hydrochlorate and valerianate of quinine have given good results. Bar and Blum praise glutaric acid as a very active antiglucosuric remedy. But besides a proper diet, I believe that bicarbonate of sodium, the salts of lithium and antipyrine, represent the surest means of controlling the morbid process.

When once we have the diabetes under control, the analysis of the urine having shown a constant decrease in the amount of sugar from the effect of treatment, and having revealed no evidence of a serious lesion of the renal or hepatic glands, the reflexes being normal, what is the next step to be taken by the surgeon? I am firmly convinced that the diabetic diathesis plays no part in the complications arising after a surgical operation. It only acts by depressing the organism and facilitating infection, the

sugar present in the tissues being an excellent medium for the growth of bacteria. Then, too, experience has demonstrated that anesthesia and the operation *per se* are factors to be considered.

Years since, the great Claude Bernard showed that glycosuria occurred after the administration of chloroform from irritation of the terminal filaments of the pneumogastric, and all surgeons are aware that in normal subjects temporary glycosuria after chloroform is not uncommon. Chloroform undoubtedly disorganizes the hepatic and renal cells and reacts on the nervous system. Ether is not free from criticism, and the same may be said of ethyl chloride and somnoform. It is, in my opinion, safer to resort to local anesthesia when possible, but if general narcosis is required, it should be of as short duration as possible, the quantity of the anesthetic being reduced by a preliminary narcosis with somnoform or ethyl chloride.

The most absolute asepsis is required. It is not the sugar circulating in the blood wherein resides the danger, but the association of pathogenic bacteria with the sugar. Then, as diabetics are weak physically, it naturally follows that the loss of blood is to be avoided.

There are certain affections which are more or less dependent upon the diabetes, such as abscess and carbuncle. General pathology teaches us that the greater the acuteness and intensity of the infectious process, the more rapid and free shall be the surgical interference. Therefore, in diabetics particularly, large and free incisions are to be made in the abscesses, and in the case of carbuncle the lesion shall be freely excised. The same may be said of diabetic gangrene, which results from an excoriation or a small wound. Local treatment is useless and high amputation of the limb is essential if a successful outcome is to be obtained. Frequently after these major amputations the sugar will be found in lesser quantity than before the interference. Let it also be said that a temporary glycosuria has been met with in cases of extensive abscess or carbuncle which has led the surgeon to suspect diabetes, but free drainage of the septic focus in the one, and excision in the other, has led to the disappearance of the sugar in the urine.

To sum up the question, I would say that in all cases of diabetes requiring operation, when the latter is not urgent for the saving of life, the patient should first be put upon a strict diet and treatment with drugs. When the glycosuria is sufficiently under control the operation may then be proceeded with. The reflexes should be nearly normal for a good prognosis, although this is not absolutely necessary. The urine should not contain either acetone or B. oxybutyric acid. The presence of urobilin or albumin should be a warning against interference. The quantity of urea secreted should be nearly normal. The length of time required for the operation and the quantity of the anesthetic given should be reduced to a miniumm, likewise the loss of blood.

Clinical Department.

THE SIGNIFICANCE OF EARACHE.

By Irving Sobotky, M.D., Boston.

"Doctor, I have a terrible pain in my ear." This statement, so often heard and so often made light of by the physician, should be the same danger signal to him as severe pain in the right iliac fossa and should be watched just as carefully as a case of acute appendicitis.

Too often the complaisant practitioner does not recognize the seriousness of earache and believes his duty done when he orders hot sweet oil to be dropped into the ear.

Now, what must the physician consider from the one symptom of earache? He must think of acute otitis media, acute catarrhal otitis media, furuncle of the auditory canal with or without diffuse inflammation, otalgia dentalis (earache due to decayed teeth). Neuralgia, affections of the maxillary antrum and tuberculous laryngitis cause referred pain in the ear, but are beyond the scope of this paper and are only mentioned as possible causes of earache in the absence of any other etiological factor.

By far the most common and the most dangerous cause of earache is an acute otitis media. Dangerous, because it can rapidly develop into a mastoiditis and a meningitis, especially in children. That is the reason why it must be recognized and treated at once; why every effort must be made to detect the tenderness on pressure, that is present when the mastoid antrum becomes involved and why the case must be referred to a competent otologist the instant there is the slightest evidence of the existence of this mastoid tenderness. Only an otologist is capable of treating a mastoiditis.

In order to recognize the condition causing the pain, the physician must be familiar with the normal appearance of the tympanum and thus be able to compare it, intelligently, with the picture presented by an acute otitis media. The text books on otology, give clear descriptions and pictures of the normal appearance of the tympanum. This study should be supplemented by the examination of normal ear drums and the identification of the landmarks.

Before examining the patient, however, these three questions can be asked. How long have you had the pain? Did the pain keep you from sleeping? Is there any discharge from the ear? The first question gives the examiner some idea of the duration of the infection. The second is a measure of the severity or intensity and the third raises the question of sufficient drainage.

A satisfactory examination of the ear cannot be made unless the ear is thoroughly wiped free of any cerumen or secretion, but it must be

borne in mind that this cleansing will produce some hyperemia, both of the tympanum and of the auditory canal.

The picture presented by the affected tympanum should now be compared with the normal. If the tympanum is of a scarlet red shade and bulges into the auditory canal and the long process of the malleus is invisible, a diagnosis of acute otitis media (suppurative) can be made. However it is not always easy to make the differential diagnosis between a suppurative and a catarrhal otitis media, especially in the early stages. As a rule the pain is much more severe and the temperature from one to two degrees higher in an acute suppurative otitis media.

As in abscess formation in other parts of the body, complete drainage of the middle ear cavity must be immediately established by means of a free, curved incision of the tympanum, or in other words, a paracentesis must be done even if the ear has commenced to drain.

If the tympanum is a yellowish red color with wavy, hair-like lines running across (exudate lines) with perhaps a few small air bubbles in the lower posterior quadrant and the pain not especially severe nor the temperature above 100 F a diagnosis of acute catarrhal otitis media must be made. In this condition the malleus is visible but the long process shows hyperemia sometimes of a high degree. At the onset of a severe catarrhal condition the appearance of the drum is very similar to the acute suppurative middle ear.

The treatment is the same as the suppurative type, namely, a paracentesis but in contrast, if there is no free drainage after the paractentesis has been done, the middle ear should be gently inflated, per Eustachian tube, and the secretion thus forced through the incision in long, tenacious, mucous strings.

As a proper paracentesis is the essential treatment, the technique will be described.

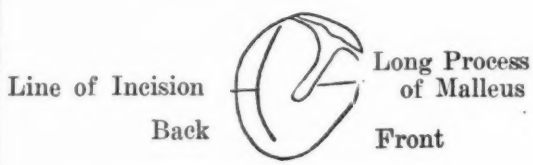
It is usually not necessary to use a general anesthetic; a local application of equal parts of menthol, cocaine and carbolic acid mixture, will give a high degree of insensibility to pain if applied to the tympanum, for five minutes, in the form of a soaked cotton tampon.

A free incision is best obtained by the use of a sharp paracentesis knife, shaped like a scalpel or curved bistoury. The arrow head shaped paracentesis knife is unsuitable.

Previous to the operation the canal should be mopped out with cotton moistened with alcohol. The instruments should be sterilized with alcohol or by boiling, and the hands should be carefully sterilized.

After sterilizing the knife, the ear speculum, and the hands, the index finger of the left hand should be placed in the convolution of the auricle, just above the external meatus and traction exerted in an oblique direction, upwards and backwards in adults, and downwards and slightly backwards in young children. This straightens the canal. With the patient's head firmly held, the knife should be introduced along the posterior part of the floor of the canal, with the cutting edge directed upwards. With an *absolutely clear* view of the tympanum the curved incision should be made in the posterior quadrant by puncturing the tympanum almost at the lower border of its attachment and incising from below, upwards. (See cut.)

Care must be taken not to insert the knife so deeply as to wound the promontory mucous membrane. After wiping out the discharge and the blood a cotton wick should be placed in the canal and instructions should be given to syringe the ear every two hours with a pint of hot boiled water, the ear syringe to be boiled at each syringing.



The patient should be seen every day until the discharge has ceased and every effort should be made to encourage free drainage as the acute symptoms may return should there be any obstruction to the flow of pus. Should these symptoms recur it is well to repeat the paracentesis.

The great danger of mastoiditis developing from an acute otitis media should compel the physician to examine very carefully the mastoid region at each visit. The neglect of the early mastoid symptoms may result in intracranial infection or in the necrosis of the anterior wall of the mastoid antrum and of the tip of the mastoid process, the abscess here showing itself as a large post auricular swelling with sometimes a burrowing of pus along the neck muscles.

As it is very necessary to differentiate between mastoiditis, and an inflammation of the auditory canal, the symptoms of both will be given:—The mastoiditis symptoms are chiefly those of pressure from the secretion in the mastoid cells. Pain, swelling, some redness and marked tenderness on finger pressure over the mastoid process together with a high temperature and constitutional symptoms are the distinguishing features of mastoid involvement. On examination with the ear speculum, a bulging may be seen in the posterior and superior wall of the canal, although this is by no means always present. Inflammation of the canal, with or without furuncle, causes great pain in the region of the ear, aggravated by moving the auricle up and down and by chewing. The diffuse inflammation may simulate the redness and bulging of the posterior superior wall of the canal in mastoiditis but differs, materially, in situation; the mastoid symptom being posterior and in the bony part of the canal, while the canal inflammation produces swelling in the in-

ferior wall of the anterior cartilaginous portion of the canal. The temperature is much lower than in mastoiditis and constitutional symptoms are lacking or very slight.

In all otitis media cases the throat and nasopharynx should be examined for enlarged tonsils and adenoid. The relationship of adenoid to frequent attacks of otitis media has been conclusively proven, hence it is the duty of the physician to *completely remove* the adenoid and enlarged tonsils after the acute symptoms have subsided. When removing the adenoid it must be the aim of the operator to remove all of the adenoid tissue, as a large central adenoid may not cause anywhere near the trouble that bits of adenoid tissue can produce in the fossa of Rosenmüller and around the Eustachian orifice.

Furuncle of the canal is a frequent cause of earache, but the pain is not as deep seated as in otitis media although it is usually more exquisite. Furuncle can readily be diagnosed as it is easy to see and moving of the auricle causes severe pain. The characteristic red swelling, about the size of a pea, extremely tender to probe touch and situated at or near the external meatus is in decided contrast to the findings in an otitis media.

The treatment of furuncle of the auditory canal consists of a free incision, under local anesthesia, the application of dry heat, and tampons of 10% ichthyol and glycerine or 3% carbolic and glycerine or 5% aluminum acetate solutions, renewed every three hours.

Impacted cerumen may cause pain in the ear but it is not severe. The presence of cerumen is easily determined and the treatment self evident.

If the ear has been carefully examined and no cause discovered for the pain, the teeth should receive the examiner's attention. Pain due to bad teeth is often referred to the ear and the prompt dental treatment of such a case will eliminate the earache.

In the absence of any of the above named conditions, the patient should be referred to a neurologist for an opinion as to the likelihood of neuralgia.

If the underlying cause is a tuberculous laryngitis or empyema of the maxillary antrum, the symptom complex will be sufficient to determine the diagnosis.

It often happens that patients complain of repeated attacks of earache either with or without suppuration. This is due, in the vast majority of cases, either to the naso-pharyngeal secretions being forced into the middle ear through the Eustachian tube, or by the blocking of the drainage by adenoid tissue at the Eustachian orifice. Hence every patient with such a history must be forbidden the use of nasal irrigations and must be warned against blowing the nose violently and thus forcing secretions into the middle ear.

If any adenoid tissue is present it is, of course, essential to remove it, as stated above.

SUMMARY.

This paper is intended as a plea to the practioner to treat earache with the respect it certainly deserves and as an aid to him for the recognition of the conditions causing the symptom.

Therefore these points are to be emphasized:

1. The cause of the earache must be determined.
2. Treatment must be prompt.
3. The patient must be closely watched for complications (mastoiditis).
4. If complications develop, despite careful treatment, the patient must be immediately referred to an otologist.
5. In repeated attacks of earache, nasal irrigations and violent blowing of the nose must be prohibited.
6. Enlarged tonsils and all adenoid tissue must be removed.

Reports of Societies.

AMERICAN CLIMATOLOGICAL ASSOCIATION.

THIRTIETH ANNUAL MEETING HELD AT WASHINGTON, D.C., MAY 6, 7, 8, 1913.

The meeting was called to order by the President, DR. CHARLES L. MINOR, Asheville, N. C.

He said that this Association was the first society in the United States to pay special attention to tuberculosis. Valuable papers on climatic treatment, careful studies on the use of tuberculin, pioneer work on nomenclature and classification, important papers on early diagnosis and on pneumothorax, and many others which had a strong influence on the development of an interest in tuberculosis in this country can be found in the 28 volumes of Transactions. A glance at the list of officers and directors of the National Association for the Study and Prevention of Tuberculosis shows that the members of the Climatological Association have been active and prominent in it from the start, and that the latter is in justice the parent of the national society. The Association has made a study of mineral springs and climatic resorts. Dr. Minor outlined his plans for widening the scope of the Association.

DR. JAMES DUDLEY MORGAN, of Washington, presented a paper on "The Effect of Climatic Changes on Rheumatism and Neuritis." Rheumatism is a disease of temperate climates; it is not always most common in winter; it is most common in adolescence and manhood, when the powers of resistance are greatest, and in moderately low temperature accompanied by moisture. Soil and climate *per se* have little to do with rheumatism, but may lessen the resistance and render the system more open to attack. Bad ventilation favors the occurrence of rheumatism. Rheumatism, neuralgia and gout are made worse by the approaching storm. The case of Captain Catlin, described by Dr. Weir Mitchell in his article on the "Relation of Pain to Weather,"

published in 1877, was referred to. Dr. J. M. Roddy's article on "Weather Forecasts and Health," 1898, was quoted.

DR. HENRY SEWALL, of Denver, read a paper on "Auscultatory Determination of Early Pathological Changes in the Lungs." Dr. Sewall said that through auscultation of the voice and whisper we have unrivalled means for the detection of minute tissue changes throughout the pulmonary region; with these are included vocal fremitus and percussion resonance. The more marked tactile fremitus and vocal resonance, distinguishing the right from the left apex of the normal lungs, depends on the immediate contiguity of the former structure, with the resounding trachea, whose vibrations are thus transmitted transversely through the pulmonary tissue. Any infiltration of this tissue which improves its conducting or resonating properties must amplify and extend the sounds heard in auscultation. It is necessary to analyze the sounds into those vibrations due to resonance of the viscera and those of the chest wall. The latter vibrations can be damped by pressure of an appropriate form of stethoscope.

Vibrations transmitting the whisper are confined almost wholly to the viscera. Modification of the voice sounds by which their quality becomes more amphoric and their duration prolonged into an echo are the striking characters which, when accentuated by stethoscopic pressure, indicate pathological changes in the viscera. This method of examination reveals the intensity and distribution of morbid changes within the lungs, even when these changes are too slight to appeal to the senses through any other method.

DR. J. N. HALL, Denver: For nearly twenty years Dr. Sewall and I have had opposite sides of the same ward of the City Hospital, and I have seen the cases as they came in. I wish to testify to the striking work that he has done. I have seen him diagnose cases which were positively unique.

DR. W. H. SWAN, Colorado Springs: Dr. Sewall speaks of the value of the x-ray in showing the early stages of tuberculosis. I think we sometimes overlook very marked signs by ordinary examination when the x-ray shows them very distinctly. I recall now a case where several experts failed to recognize a well-marked and large cavity, but the x-ray showed a very distinct cavity, with definite outline and thickened wall. Even after it was demonstrated by the x-ray there were absolutely no physical signs to show it. This must lead us to be very cautious as to many of our physical findings.

DR. WILLIAM LEROY DUNN, Asheville, N. C.: I would like to know what particular formula the doctor has found especially adapted in this whisper voice in bringing out the best evidence.

DR. SEWALL: I direct the patient to repeat the words, "one-two-three" and note the prolongation of the sound from one syllable to the other, as well as the change in quality. If what I have said is true there is rarely need for any tuberculosis except in certain particular instances, to reach the open stage. My thesis is that the procedures of physical diagnosis within our reach are capable in the vast majority of cases of disclosing the presence of glandular and pulmonary tuberculosis in a stage so early that not only is the patient still non-infective, but is capable of responding to the curative measures of hygienic living.

DR. P. M. CARRINGTON, of the U. S. Public Health Service, read a paper on "The Climate of San Diego, California, with Relation to Renal Diseases." The author had recovered from a tubercular infection in New Mexico, and afterwards derived great benefit from a two years' residence in San Diego, where he was sent to recuperate from an attack of nephritis. The rainfall of San Diego is given as ten inches, occurring from October or November until March. The relative humidity ranges from 67% in December to 80% in July, with a mean annual of 75%. Occasionally temperatures of 100° F. have been recorded, and as low as 32° F. The equability of the climate is marked. The climatology of nephritis was discussed with special reference to the San Diego region. Cases were cited to show the benefits derived in this class of cases. It is a climate which necessitates no seasonal change of clothing, and suitable fruits and vegetables are grown all the year, making proper diet obtainable.

DISCUSSION.

DR. POTTENGER: We know there is a very great difference in the climatic conditions of places comparatively close together, because Los Angeles has one climate, Santa Barbara has a still different one, San Francisco still another. San Diego is particularly suited to this type of disease, having a very equable climate, free from rapid changes. At Monrovia, one hundred miles away, our daily variation is thirty degrees. If you will take the temperature at 7o'clock in the morning and add 30 degrees you will have the maximum temperature for that day.

DR. A. C. GETCHELL, Worcester: Many of the patients that I have to do with from time to time owe their troubles very largely to the effect of the climate in which they are living, and I hope that the men who live in these better climates will continue to impress upon us their importance in the treatment of pulmonary tuberculosis. It is true that it is impossible for large classes of patients to take advantage of the better climates. There is a growing tendency toward treatment of disease by hygiene and diet, and other matters which pertain to biology of the system. I think that the quality of atmosphere lived in and breathed is an exceedingly important matter in the treatment of disease, and the value of climate cannot be too persistently impressed upon us.

DR. CASSELBERRY: A brief sojourn at San Diego some years ago tends to confirm its climatic advantages as described by Dr. Carrington. There is not only equability of temperature, but the general quietude is conductive to equanimity of mind, with a disposition to get out into the sunshine, and but little disposition to do anything else.

DR. GEORGE W. NORRIS, of Philadelphia showed a series of lantern slides made from frozen sections of the cadaver, illustrating various anatomical relations of importance in thoracic diagnosis, such as: The relative distance of the lungs and heart from various points on the thoracic wall. (2) The causes for the physiologic differences in tactile, auscultatory and percutory findings on the two sides of the chest. (3) The position of the heart and lungs in cases of pleural and pericardial effusion. (4) The location of early and late tuberculosis lesions of the lungs. (5) The location of the cardiac valves in relation to each other and to the anterior chest wall.

DR. PHILIP KING BROWN, of San Francisco, showed lantern slides illustrating the frequency and extent of peribronchial lymph-gland tuberculosis in cases with some constitutional symptoms without marked physical signs. The general tendency of infections from this source to extend upward to the apices, the plates showing the various stages of this extension. In general, the contribution of x-ray plates of the chest aids in the diagnosis of tuberculosis of the lungs.

DR. J. C. WILSON, Philadelphia, read a paper on

BLOOD-SPITTING IN HEART DISEASE.

The syndrome hemoptysis occurring in cardiac cases is better studied in office work than in any other clinical relation. Its incidence is much more frequent than the literature would indicate. It is often overlooked in history-taking. Brief statistical studies: the clinical variations; the association with pulmonary lesions; difficulties in diagnosis; immediate and remote prognosis. Remarks upon treatment.

DISCUSSION.

DR. J. M. ANDERS, Philadelphia, Pa.: I wish to emphasize the difficulty that I have met with in a few cases in differentiating aortic insufficiency associated with hemorrhage of the lungs from pulmonary tuberculosis. It is true that cases of aortic insufficiency associated with pulmonary hemorrhage form but a small percentage of the total. On account of certain symptoms, such as flushes and night sweats leading to exhaustion and blood spitting, all of which may arise in aortic regurgitation, this disease may bear a close resemblance to pulmonary tuberculosis. I agree with Dr. Wilson that the incidence of blood-spitting in cardiac diseases is greater than has been supposed. In the treatment, also, I fully agree that no special form of medication should be instituted, except in the very few instances where there is great exhaustion.

DR. DELANCEY ROCHESTER, Buffalo, N. Y.: I do not think that we can always positively say that hemoptysis is due to heart disease alone without further inspection of the lung. I call to mind one case, exceedingly instructive, of a young lad with rheumatism, with an endocarditis, mitral stenosis and aortic insufficiency combined,—a combination which I rarely have seen. He came in spitting blood, and no tubercle bacilli were found in his sputum. He improved decidedly, and finally got up and was moving about the ward. He was suddenly taken with severe pain and hemorrhages, and he had all the signs of a pulmonary infarction. Tubercle bacilli appeared in his sputum. There was a case which would undoubtedly have gone without appreciation of involvement of the lung, except that he was under observation. The boy finally died of tuberculosis. Unfortunately, an autopsy was not allowed. Within the last two years there has been brought forward in Buffalo through the studies of Dr. Bush and Dr. Clowes, Dr. Bush being the professor of physiology, and Dr. Clowes assistant in the New York State Cancer Laboratory, a means of treatment of hemorrhage which has proved very successful in various cases. This is the production of a serum from which the antitrombine, which is normally in the blood, is removed by their method of procedure. I will not go into detail because a paper will be published in the *New York State Medical Journal* in regard to this matter. About 15 c.c. of the solution is made, and is injected subcutaneously, or in some cases intravenously, I think, which has as good results in one way or the other. These injections stop hemorrhage in many cases. In 5 cases, 3 of pulmonary tuberculosis and 2 of hemorrhages of the stomach, the results have been remarkable, the hemorrhage stopping within a few hours after the injection of the serum, and not recurring. Sometimes a number of injections are necessary, but I understand that this material will be put upon the market soon from one of the large manufacturing houses. Of course all hemorrhages cannot be stopped with a serum, but I think it is well worth considering.

DR. J. H. ELLIOTT, Toronto, Canada: I would like to relate one case, a woman about 36 years old, who has had recurring hemorrhage for some 15 or 16 years; they were supposed to be due to pulmonary tuberculosis. No tubercle bacilli had ever been found, but when I first examined her I found a fibrous condition of the right apex. The signs were slight, however. During the first two hemorrhages I could find no physical signs in the lungs. On the third occasion I was rather surprised to find the signs in the left apex, opposite to that which I had diagnosed formerly as tuberculous. At this time there was present, which I had not found before, a murmur of mitral regurgitation. The heart was somewhat enlarged; I had an x-ray made of the chest, and with the fluoroscope there was a pulsating tumor on the descending arch of the aorta, the side on which the physical signs of hemorrhage had appeared.

DR. J. C. WILSON, Philadelphia: The importance of blood-spitting in heart disease depends on two facts. First, that in the great majority of cases the blood lost is very small and the hemorrhage occurs at long intervals. Its symptomatic value may for this reason be wholly overlooked. Second, that hemoptysis, to many practitioners, suggests disease of the lungs rather than disease of the heart. Hence uncertainties, even errors, in diagnosis. The difficulties in diagnosis are increased by the occasional occurrence of copious blood-spitting in heart disease and in associated cardiac disease and pulmonary tuberculosis. The necessity of a correct diagnosis in any given case arises from the facts that blood spitting in heart disease tends to relieve congestion and is often followed by relief of symptoms and does not really call for energetic treatment; whereas the blood-spitting of lung disease usually demands active therapeutic measures, and is liable to be followed by fever, broncho-pneumonia and an extension of the original process.

DR. JOSEPH H. PRATT, of Boston, made a communication on "The Action of Carbon Dioxide Baths on Blood Pressure, with a description of a new functional Test of Cardiac Efficiency." The author has been making these observations on carbon dioxide baths for eight or nine years. Shortly after these baths were employed in heart disease the claim was made that the pressure was raised because it was thought desirable in these cases to raise it; later the announcement was made that the action was to reduce blood pressure. Gottfried Müller, in careful studies of the action of these baths in healthy subjects, concluded that their chief action on the blood pressure was dependent on the temperature of the water. Dr. Pratt used a bath of

40 gallons of water at 90° F. for ten minutes, containing 1000 c.c. strong hydrochloric acid and 1000 gms. of sodium bicarbonate. He does not use calcium chloride or sodium chloride. In a case of moderate cardiac inefficiency there will generally be a silght elevation of the blood pressure. He found also that in cases of marked cardiac inefficiency there was a fall of pressure at that temperature. Dr. Pratt advanced the opinion that the response of the blood pressure in a given case of heart incompetency, when treated by carbon dioxide baths of the strength noted, is an index of the degree of the incompetence, and in case of a fall this plan of treatment would be counterindicated.

DR. JUDSON DALAND of Philadelphia read a paper entitled "Clinical Observations on Blood-Pressure." Dr. Daland prefers the mercurial instrument as being more accurate. Diastolic pressure observations are often omitted whereby valuable information obtained from a study of the low and mean pressure is lost. Repeated examinations were advised. The whole subject was analyzed. Time of day, occupation, position, temperament and circumstances connected with a visit to the physician's office modify the record. Extraordinary variations, all tending to hypertension, are observed in the neuropathic. Driving an automobile for two hours through crowded streets caused an increase of 30 mm. in the systolic blood-pressure and 15 mm. in the diastolic. Neurotic women, experiencing fright when having pressure measured, have a marked rise. Hypertension due to uremic states is usually uninfluenced by most drugs. In a case of Addison's disease with great destruction of the adrenals, the systolic pressure was 90 mm., and the diastolic pressure was 70 mm.

(To be continued.)

Book Reviews.

Practical Prescribing, with Clinical Notes. By ARTHUR H. PRICHARD, M.R.C.S., L.R.C.P., R.N. London: Henry Frowde, and Hodder and Stoughton 1913.

This volume in the Oxford Medical Publications series is essentially a case-history book in internal medicine,—the first of its type in England. The author's aim was to supply information of service to students and practitioners wishing to obtain practical knowledge of prescribing. The common medical diseases are grouped under convenient pathologic or regional headings, and each is illustrated by one or more selected, epitomized cases, with treatment, note, and comment. Though somewhat different in mode of presentation, the method is essentially that familiar in the highly successful American case text-books. The value and vitality of this method of instruction are now so well recognized in this country as to require no further comment. The present volume is evidence of the beginning development of a similar advance in British medical teaching.

The Practitioner's Practical Prescriber. By D. M. MACDONALD, M.D. London: Henry Frowde, and Hodder and Stoughton. 1913.

This small volume in the Oxford Medical Publications series is intended as a pocket formulary and epitome of symptomatic treatment. Portions of it have already been published discretely in the *Clinical Journal,* the *Practitioner,* the *Hospital,* and the *British Medical Journal.* The first part, comprising about three-fourths of the book, is an alphabetic syllabus of the therapeusis of common diseases from abortion to whooping-cough. The second part consists of juvenile and adult posologic tables; the third gives practical directions and points in prescribing; the fourth enumerates the common incompatibles; the fifth consists of "therapeutic brevities"; the sixth describes the treatment of emergencies in everyday practise; and the remaining sections deal with diet tables, gavage, recipes, duration of pregnancy, and other miscellaneous information. On general principles, one does not approve such rule-of-thumb reference books and compendia, but the present manual seems in the main accurate and as little objectionable as any of its class.

The Deaths of the Kings of England. By JAMES RAE, M.A., M.D. London: Sherratt and Hughes. 1913.

From time to time during recent years there have appeared in the *British Medical Journal* interesting articles on the death-beds of several British monarchs. Further study on this subject is, however, now made superfluous by this admirable and absorbing work of Dr. Rae. He has collected from records and historic manuscripts the authentic original data in the case of each king, or ruler, and of his consort, presenting a complete case-history series, with diagnostic discussion, from William First to Fourth. Moreover, in his introduction, he has analyzed this series of cases, classifying the various causes of death, as in vital statistics. Interestingly enough, in spite of the almost continuous relationship between the patients, there is a striking absence of familial or . hereditary disease. Chronologically the kings fall roughly into groups, in which the cause of death corresponds approximately with the conditions of life. The early, campaigning kings, died of trauma or dysentery, those of medieval times by infection, those of recent times of pulmonary, cardio-renal, or circulatory disease.

The volume is not only an excellent piece of medico-historical research, but might to advantage even be employed as a text-book for case-teaching in clinical diagnosis. The author deserves the greatest praise for the scholarly and scientific accuracy and literary merit of this unique monograph.

THE BOSTON

Medical and Surgical Journal

THURSDAY, FEBRUARY 26, 1914.

A Journal of Medicine, Surgery and Allied Sciences, published at Boston, weekly, by the undersigned.

SUBSCRIPTION TERMS: *$5.00 per year, in advance, postage paid, for the United States. $6.56 per year for all foreign countries belonging to the Postal Union.*

Papers for publication, and all other communications for the Editorial Department, should be sent to the Editor of the Boston Medical and Surgical Journal, 809 Paddock Building, 101 Tremont Street, Boston. All orders for reprints must be sent in writing to the Editor on or before the day of publication.

The Journal will furnish 100 reprints free, if requested in writing.

All letters containing business communications, or referring to the publication, subscription or advertising department of the Journal, should be addressed to the undersigned

Remittances should be made by money order, draft or registered letter payable to

W. M. LEONARD,
101 TREMONT STREET, BOSTON, MASS.

TUBERCULOSIS FOLLOWING TYPHOID FEVER.

SOME time ago Lieutenant-Colonel Charles F. Woodruff of the Medical Corps, U. S. Army, now retired, became impressed with the idea that tuberculosis was extremely apt to follow typhoid. During the past two years he has been engaged in extended and painstaking researches in this country and in Europe, with a view to ascertaining whether this were actually the fact or not, and in an elaborate paper read at the January meeting of the Medical Association of the Greater City of New York he made the distinct claim that there is a definite relation between the two diseases. Some preliminary comment on this paper was made in the issue of the JOURNAL for Feb. 12 (p. 259).

It is not strange, he thinks, that medical literature should be so devoid of studies regarding this matter when we consider that the long interval which may elapse between the beginning of tuberculous activity and the onset of symptoms generally prevents the discovery of the activating cause. Consumptives appear to have had more typhoid than the rest of the population, though there is no way of determining this point accurately. Statistics which were quoted indicate, however, that such is probably the case, and there are other facts which, taken together, are believed to show a relationship between typhoid and tuberculosis, though each by itself is of little value. Thus, the mortality curve of tuberculosis, which rises rapidly from childhood, reaches its maximum before thirty and declines after thirty-four, while the maximum in the curve of typhoid is reached at fifteen and declines after twenty-five. The curve of tuberculosis seems to follow that of typhoid after an interval of about nine years, and the average length after tuberculosis is said to be seven years. This might mean, therefore, that the typhoid, mostly contracted before twenty-five or thirty, has been partly responsible for raising the maximum mortality from tuberculosis nine years later. Again, it is significant of the relation of typhoid to tuberculosis that males predominate in the deaths from both causes. Furthermore, where typhoid fever is prevalent there should be more tuberculosis than in places free from typhoid, and variations in the typhoid death-rate should be followed by similar variations in the tuberculosis deaths there. It is also evident that in a place where tuberculosis is quite common, typhoid should have more effect in increasing the death-rate from tuberculosis than in places having little tuberculosis.

These propositions, Colonel Woodruff believes, would seem to be proved by a series of charts which he found in the Office International d'Hygiene Publique in Paris, in which it is worthy of note that the two curves show more or less parallelism throughout the civilized world. On the charts are given the curves for other infections,—smallpox, diphtheria, scarlet fever, and plague; but these came in epidemics, and presented irregularities having no apparent relation to the two endemic diseases. Unfortunately, neither measles nor whooping-cough, which, together with typhoid, he regards as the diseases most frequently followed by pulmonary tuberculosis, was considered of sufficient importance to record, and there is no means of determining how far they were responsible for irregularities in the curves. The curves indicate, in general, that for every reduction of five deaths by typhoid there are more than three lives saved from death by tuberculosis in the time covered by the charts. Karl Pearson, the eminent statistician, warns, indeed, against drawing conclusions from parallel curves, as it not infrequently happens that there are two independent causes at work, one for each set of facts, and wholly unrelated; but in view of the evidence that typhoid is frequently followed by tuberculosis, Colonel Woodruff thinks there can be no reasonable doubt that the reduction of

typhoid is responsible for a good share of the modern reduction of tuberculosis.

He stated that in the United States Army the dependence of tuberculosis upon typhoid was seen after 1890, when, as in civil life, bacterial diagnosis became more common; but after antityphoid vaccine was widely used, tuberculosis ceased to decline with the typhoid. Major F. F. Russell of the Army Medical Corps, who was largely instrumental in having antityphoid vaccination introduced into the army, was one of those who participated in the discussion of the paper, and he took issue very decidedly with its author in regard to the latter statement. If, he said, the contention were true that such vaccination activates tuberculosis, there should have been some increase in the amount of tuberculosis in the army; whereas the records published in the annual reports of the Surgeon General distinctly showed that for the past five years, during three of which antityphoid vaccination had been compulsory, there had been a steady decline in the disease.

REORGANIZATION OF THE MASSACHUSETTS STATE BOARD OF HEALTH.

THE recent report by a surgeon of the United States Public Health Service upon the public health administration in Maryland is of particular interest at this time in Massachusetts since the question of the reorganization of the State Board of Health has come up. Dr. Fox made a careful study of the state department of health and under agencies, having sanitary functions, in the state of Maryland. His study continued during the last six months of 1913. Some of the conclusions are particularly timely.

"From this investigation it is seen that the state board of health has been merged into a department in which, however, it retains the executive control and quasi-legislative powers. Since the board does not sit constantly, however, in the interim of meetings the duties arising must be performed by the executive officer of the department. At least theoretically, therefore, the responsibility and the power of initiation to meet emergency does not appear to rest squarely enough on the administrative official whose duty it is to handle the executive work."

"Furthermore, by reason of the method of appointments on the state board of health it would be possible at any time for its personnel to be so changed for political reasons as to include members without the necessary knowledge of public health needs. While the present board is composed mainly of men of eminence in public health matters, who support the secretary in his actions, it might at times become political at the will of the governor of the state."

"Generally speaking, state boards of health by reason of their organization and slow-moving methods are not in position to exercise all the functions which should be required of a department of health. The state department of health should be able to act quickly and efficiently, and in our opinion this can best be accomplished when it is presided over by an all time health official who has as his subordinates a sufficient number of capable bureau chiefs and a board or council composed of public officials, business and professional men, to act in an advisory capacity only. This officer should have the power of initiation and he should have as a part of his department an adequate county or district health organization which should be subject to the control of the state department and work under it for the prevention of disease and the improvement of the public health."

"It would appear to be the modern tendency to place organizations such as departments of health under the control of one head, as instanced in the states of New York and Pennsylvania, and in the Philippine Islands."

The argument seems to us to be sound. We believe that the same conditions and the same reasons which induced the special public health commission of the state of New York to recommend, and the New York legislature of 1913 to vote to change a state board of health into a system of a single highly paid commissioner of health with an advisory board hold equally well in Massachusetts.

There are a number of bills before the present legislature with the view of reorganizing the state board of health. Practically all of them call for a paid board of several members. According to the Public Health Bulletin, No. 54, of the United States Public Health Service, only one state has a paid board of health. The other states have either unpaid boards or a single commissioner. It seems to us that the tendency of the times and the weight of authority is entirely in favor of the single commissioner of health with an advisory board. Experience has shown that men of large calibre and of great experience in public health will give freely of their time

to the state in an advisory capacity. The entire time and services of such men cannot be secured by the state on paid boards. If the state board of health is to be reorganized, and on the whole reorganization seems desirable, we disapprove of the paid board of health and heartily endorse the system of a single highly paid commissioner of health in authority, with an advisory unpaid board.

UNIFORM CHILD LABOR BILL.

The legislature of 1913 made an important step in public health by passing in its essential form, the uniform child labor bill. The uniform child labor bill had been carefully considered for a number of years and was adopted by the Commission on Uniform Laws only after prolonged careful study. The essential part of the bill was the reduction in the hours of work for children under sixteen, from ten hours a day to eight hours a day. In other words, it made compulsory in all the occupations throughout this state, the standard hours of work that are accepted by the state and by most municipalities when they employ labor. From a public health point of view, this was a sane step towards a better and healthier class of workers. It is generally agreed that to attach a child of fourteen to a machine for long hours each day makes that child prematurely old. The reduction of a working day to eight hours is little enough, but it gives a child from fourteen to sixteen some opportunity for out-of-door exercise and recreation, and counteracts to some extent the serious effects of fatigue upon the nervous system.

As might be expected a number of bills have been introduced into the Massachusetts legislature this year either to repeal or to modify this law so that children under sixteen can again be worked ten hours a day. In the daily press there have been featured some irresponsible statements that the child labor law of 1913 has thrown children out of work and has allowed them to roam the streets in idleness.

Careful investigation of the facts has shown, in the first place, that few children have been discharged. In most instances in Massachusetts, as in Ohio, the mills have found little difficulty in adjusting the eight-hour day of children under sixteen to the usual working day of ten hours, which holds for the other workers. In the second place, the hardships in individual families brought about by this change have been almost negligible.

It would be surprising indeed if some little hardship did not come to a few in order that large numbers might be benefited. It is inconceivable that any one can seriously believe that the health and general welfare of children between fourteen and sixteen years of age can be improved by putting them back into the mills and shops for two hours longer each day. Even in the exceptional case where the strongest boy of fifteen may not be harmed by ten hours' work a day, he is probably better off with eight hours' work and some play, with the opportunity of putting some of his energy into study or industrial education.

Children under sixteen should not work more than eight hours a day. The bills which seek to repeal or modify the eight-hour law for children under sixteen should be defeated.

MEDICAL LEGISLATION. REGISTRATION OF VITAL STATISTICS.

There is at present pending before the Massachusetts General Court a bill providing that the registration of vital statistics in this Commonwealth be placed in charge of the State Board of Health. This work is at present done by local authorities in each community, often a city or town registrar. The State Board of Health must then coördinate this information for its own use, with resultant inaccuracy and duplication of labor.

"The present bill provides in the first place that the State Board shall have charge of the registration of births, marriages and deaths in the state, shall assume the administrative work necessary to do this, including the way in which it shall be done, shall designate the forms and blanks to be used, and have authority to enforce the law throughout the state in a thorough and uniform manner.

"It is proposed to create under the State Board a director to be named state registrar of vital statistics, and registration districts are provided, the same to be the different cities or towns. The act further provides a penalty for the registrar in any district who shall in the judgment of the State Board fail or neglect to discharge efficiently the duties of his office or

who shall fail to make promptly the required returns."

Massachusetts is one of the few registration states where vital statistics are not lodged primarily in the hands of the State Board of Health. It seems eminently desirable that this anachronism should now be corrected.

MEDICAL LEGISLATION. DISCLOSURE OF PROFESSIONAL INFORMATION.

THERE is at present pending before the Massachusetts General Court, and now under consideration by the Committee on Judiciary, a bill to prevent the disclosure of professional information by physicians and nurses on the witness-stand, "unless such information indicates that the patient has been the victim or subject of crime." This raises again the old question of the admissibility of privileged medical communication as testimony and of the sanctity of *sub sigillo* statements. In point of practise, expert evidence in court is largely concerned with matters of fact and opinion, and seldom involves the quotation of hearsay. The status of the medical expert is still far from satisfactory, but it does not appear that this bill would in any way amend it. It seems better that physicians, like other witnesses, should be required to answer all questions allowed by the court, and that the court should exercise discretionary jurisdiction as to what questions may be asked, and as to the proper application of the evidence.

MEDICAL NOTES.

POSTPONEMENT OF ACTION ON RADIUM CONSERVATION.—In the issue of the JOURNAL for Jan. 29 (p. 176) we commented editorially on the Foster Radium Conservation Bill, then pending before the United States House of Representatives. The Rules Committee of the House decided on Feb. 5 not to allow the House to take up this measure at the present session. A similar measure, however, the Thomas Radium Conservation Bill, is still under consideration by the Miners' Committee of the Senate.

LONDON DEATH-RATES IN DECEMBER, 1913.—Statistics recently published show that the total death-rate of London for December, 1913, was 14.9 per 1000 inhabitants living. Among the several districts and boroughs the highest rate was 19.7 in Shoreditch, a crowded east-side slum; and the lowest was 11.0 in Lewisham, an open southern suburb.

A LIVING BRITISH CENTENARIAN.—Miss Ritso, of Bath, England, is said to have been born on Jan. 26, 1812. Her parents were both centenarians.

BOSTON AND NEW ENGLAND.

TWO CENTENARIANS.—Mrs. John Y. Belyea, who died in Upton, Mass., on Feb. 15, is said to have been born on May 24, 1808, at St. Johns, N.B. She was married in 1833, but had been a widow since 1880. She migrated to the United States in 1891. She is survived by one aged daughter.

Mrs. Kate Montosky, who died at Collinsville, Conn., on Feb. 17, is said to have been born on Sept. 14, 1810, in Russia. Her health was exceptionally good until recently.

LAWRENCE GENERAL HOSPITAL.—The recently published thirty-eighth annual report of the Lawrence (Mass.) General Hospital and Children's Home records the work of those institutions for the year ended on Sept. 30, 1913. During this period a total of 3800 patients were treated in all departments of the hospital, including 165 obstetric cases. Eight nurses were graduated from the training-school.

HOSPITAL BEQUEST.—The will of the late Catharine E. Galvin, of Watertown, Mass., who died on Jan. 15, was filed on Feb. 16, in the probate court at East Cambridge, Mass. It contains a bequest of $2000 to the Carney Hospital, South Boston.

NEW YORK.

O'LOUGHLIN MEMORIAL.—A new emergency ward in St. Vincent's Hospital, designed as a memorial to Dr. Francis N. O'Loughlin, the senior ship surgeon of the White Star Line, who lost his life in the disaster to the Titanic, was dedicated to the use of disabled seamen on February 16. Dr. O'Loughlin was a constant visitor to St. Vincent's, in attendance on injured sailors, and at the exercises the principal address

was made by Dr. Edward C. Titus, for many years an associate of his.

Radium Institute of America.—At a meeting of the Radium Institute of America, held at Columbia University on Feb. 17, papers were read by Prof. George B. Pegram, Prof. William Duane of Harvard, Francis C. Wood, director of cancer research, Columbia University, and others. The principal address was made by Dr. Robert Abbe of New York, who was among the first investigators to make practical use of radium, and in it he announced that he had just received a report from Dr. Alexis Carrel, who, at his request, had been making researches at the Rockefeller Institute, and that this report had convinced him that the manner in which he had been applying radium in the treatment of malignant and other growths was wrong. The experiments of Carrel had demonstrated that the gamma rays, which had been depended upon for stopping cellular growth, were almost entirely inert, while the beta rays, which had been considered of little or no value, were extremely active in this respect. "His (Carrel's) experiments," said Dr. Abbe, "are only just beginning. Where they will end I will not attempt to forecast, except to suggest that within five years from now we will know vastly more about radium than we know at this time. . . This new method of studying the isolated rays emitted by radium will end our period of confusion as to the qualities of each ray. I know that the action of each ray is different from the others, but more work under Dr. Carrel's cautious hands and on the part of others will be needed before we can assign to each division of the isolated rays its exact rôle."

Inoculation for Tuberculosis.—At a recent meeting of the City Board of Health a resolution was adopted denying the application of Dr. Hans Karfunkel for permission to inoculate living cultures of an unidentified bacillus in the treatment of tuberculosis. Some time ago Dr. Karfunkel, who is from Berlin, made the application referred to, and, in compliance with the rule of the board, he described in full the manner of using the vaccine and submitted a culture for examination. He stated that the culture was originally obtained from an abscess developed in a patient after inoculation with Piorkowski's vaccine, and subsequently the same living organism was said to have been found in other vaccines used for the treatment of tuberculosis. Examination at the Research Laboratory, however, showed that the organism was in no way related to the tubercle bacillus, but that it belonged, in fact, to the group of spore-bearing bacilli of which the hay bacillus is the main type.

Death-Rate for Week Ending Feb. 14, 1914.—There were 1553 deaths and a death-rate of 13.88 per 1000 of the population reported during the past week, against 1732 deaths and a rate of 16.82 for the corresponding week of 1913, a decrease in the absolute number of deaths of 179, equivalent to a decrease in the relative number of deaths of 313—and a decrease of 2.94 points in the rate.

The following causes showed an increased mortality: Measles, scarlet fever, diphtheria and organic heart diseases; typhoid fever and cerebro-spinal meningitis were accredited with the same number of deaths as in the corresponding week of 1913. The following causes showed a decreased mortality: Whooping cough, influenza, bronchitis, lobar pneumonia, bronchopneumonia, pulmonary tuberculosis, other forms of tuberculous diseases, Bright's disease and nephritis, diseases of the nervous system and violence.

The number of deaths reported during the week of infants under one year of age was 226, which was 72 less than in 1913; the number of deaths of children under five years of age was 348, a decrease of 110 deaths; from five to sixty-five years there was a decrease of 54 deaths, and at sixty-five years and over a decrease of 15 deaths.

The death-rate for the first seven weeks of 1914 was 14.61 per 1000 of the population as against a rate of 14.98 for the corresponding period of last year.

The Use of Common Cups, Towels, and Forks.—Attention having been called to the fact that the Board of Health regulations with respect to common drinking cups and roller towels, are not being observed as they should be, Commissioner Goldwater is taking steps to secure fuller compliance with the department regulations. Letters have been sent to those found violating the sections of the Sanitary Code with respect to drinking cups and roller towels, warning them that a continuance of the offense will render the offender liable to arrest and prosecution.

In this connection, it may be stated that the department is also contemplating action against the use of common forks at the saloon free lunch counters. Investigation has shown that forks, used by one person in eating from a common dish of some food, such as hash, potato salad, sauerkraut, etc., are returned after using, to a glass containing some cold water only, to be picked up and used in the same way by succeeding persons. This very personal tool thus comes into more or less intimate contact with the saliva of the mouth and the mucous membrane of the tongue and lips.

In view of the fact that disease-producing bacteria, some of them a most virulent kind, may be present in secretions of the mouth and throat, it is deemed important to prohibit this common use of such eating utensils. In an examination of the common bar-room fork, undertaken sometime ago in Louisville, disease germs were found in thirteen out of sixteen specimens examined. It is suggested that the food at such lunch counters be prepared beforehand in the form of sandwiches, etc., and handed out to the individual, or else each customer be given food on a plate with individual utensils and that these utensils be thoroughly washed after using.

SMALLPOX AT NIAGARA FALLS.—On Feb. 1, there were 130 cases of smallpox at Niagara Falls, N. Y. If the epidemic continues, it may become necessary to isolate the entire town.

SALE OF BICHLORIDE TABLETS.—In last week's issue of the JOURNAL we commented editorially on legislative regulation of the sale of bichloride of mercury tablets. On Feb. 17 a regulation was adopted by the New York board of health, providing that after March 1 bichloride of mercury tablets may be sold at retail only on prescription of a physician.

Current Literature

MEDICAL RECORD.

JANUARY 31, 1914.

1. THOMPSON, W. G. *Occupational Diseases.*
2. HEISER, V. G. *Beriberi. An Additional Experience at Culion. How Can a Knowledge as to Its Prevention Best be Applied from the Standpoint of State Medicine?*
3. NICHOLS, H. J. *The Relation of Experimental Syphilis to Eugenics.*
4. *WAGNER, J. *Report of Cases of Amebic Dysentery Treated with Emetine.*
5. SOLOMON, M. *Some Remarks on the Meaning of Dreams.*
6. GWYN, M. K. *The Healy Puzzle Picture and Defective Aliens.*
7. STEWART, D. H. *A Vegetable Hormone in Cases of Ileus and Gastric Dilatation.*
8. HUBBY, L. M. *The Treatment of Deafness with Sonorous Vibrations by the Zünd-Burguet Method.*
9. GREENWALD, M. *Clinical Observations of Auscultation at the Acromion Process.*

4. Wagner reports a small number of cases of amebic dysentery successfully treated with emetine hydrochloride. He finds the action of this drug specific in this disease. It should be given, he says, in gr. ½ doses hypodermically daily for seven days. The effect is immediate and pronounced, and no untoward symptoms are observed. As recurrence may occur, a repetition of the treatment is advisable. The administration of emetine is a useful test in the diagnosis of diarrhea of obscure origin; if the condition is relieved it is proved to be amebic dysentery. [L. D. C.]

NEW YORK MEDICAL JOURNAL.

JANUARY 31, 1914.

1. MILLS, C. K. *Neurology at the Recent (Seventeenth) International Congress of Medicine.*
2. GWATHMEY, J. T. *Oil-Ether Anesthesia.*
3. NOVACK, H. J. *Large Gallstone Passed per Viam Naturalem.*
4. KNOX, H. A. *Mental Defectives.*
5. KENNEDY, J. W. *Foreign Bodies in the Appendix.*
6. HILLS, R. *The Modern Treatment of Chronic Nephritis.*
7. CUNNINGHAM, W. P. *Dermatoses Neuroticae.*
8. ROSENBLOOM, J. *On Testing Urine for Bile Pigments and for Diacetic Acid.*
9. VAUGHN, V. C. *The Etiology of the Infectious Diseases.*

SURGERY, GYNECOLOGY AND OBSTETRICS.

JANUARY, 1914.

1. *LAMBERT, A. V. S. *Treatment of Diffuse Dilatation of Esophagus by Operation.*
2. *CLARK, J. G., AND KEENE, F. E. *The Relation Between the Urinary System and Diseases of the Female Pelvic Organs.*
3. *BLOODGOOD, J. C. *Diagnosis and Treatment of Borderline Pathological Conditions.*
4. *LEONARD, V. N. *The Post-operative Results of Trachellorrhaphy in Comparison with Those of Amputation of the Cervix.*
5. *BOORSTEIN, S. W. *Syphilis of Bones and Joints. with Report of Ten Cases.*
6. *SULIG, M. G., AND TOBOLSKE, L. *The Inguinal Route Operation for Femoral Hernia; with a Supplementary Note on Cooper's Ligament.*
7. SHERMAN, H. M. *Congenital Dislocation of the Hip. A Rational Method of Treatment.*
8. KERR, N. *Tumor of Large Nerves Associated with Fibroma Mulluscum; with Exhibition of Largest Specimen on Record.*
9. FRINK, V. A. *Cysts of the Omentum; with Report of a Case.*
10. BENDIXEN, P. A., AND BLYTHING, J. D. *Pneumatic Rupture of the Bowel.*
11. STRAUSS, A. A. *An Artificial Ureter Made from the Abdominal Wall.*
12. GARDNER, J. A., AND SIMPSON, B. T. *The Relation of Multiple Adenomata to the Etiology of Enlargement of the Prostate Gland.*

1. Lambert suggests cardioplasty as the operation for the relief of diffuse dilatation of the esophagus. Cases resulting from cardiospasm can be permanently

cured this way. In these cases the esophagus is found to be lengthened as well as dilated. The operation is by the abdominal route, after a preliminary gastrostomy.

2. Clark and Keene show by excellent diagrams the close and important relationship between pelvic disease in the female and diseases of the urinary system. They urge routine cystoscopic examination in all cases presenting vesical symptoms.

3. Bloodgood's article is of the type which is of extreme importance to surgeons in educational work for the general practitioner.

4. Leonard believes that the presence of a marked endocervicitis should be considered as a contra-indication to trachellorrhaphy. Post-operative hemorrhage occurs in about 5 per cent. after amputation of the cervix, but very rarely after thachellorrhaphy, the improvement in symptoms after the latter operation being as great as that from the former. Trachellorrhaphy, unlike amputation of the cervix, is not a curative operation for endocervicitis. Fertility is much more likely to follow trachellorrhaphy than amputation of the cervix, which latter is more liable to be followed by abortion than the former, which has no effect on subsequent pregnancy. Labor after amputation may be very difficult, while normal after trachellorrhaphy. Trachellorrhaphy then is the operation of choice in women of child-bearing age.

5. Boorstein's article on syphilis of bones is well illustrated by case reports and plates.

6. Sulig and Tobolske advocate and plainly explain the inguinal route for cure of femoral hernia.

[E. H. R.]

THE QUARTERLY JOURNAL OF MEDICINE.

1. *WARRINGTON, W. B. *Intracranial Serous Effusions of Inflammatory Origin. Meningitis or Ependymitis Serosa—Meningism—with a Note on "Pseudo-tumors of the Brain."*
2. *ELLIOTT, T. R. *The Experimental Formation of Acute Gastric Ulcers.*
3. *GASKELL, WALLIS, SLADDEN, VAILE AND GARROD. *A Contribution to the Study of Bronzed Diabetes.*
4. *GIBSON, A. G. *On the Infective Nature of Certain Cases of Splenomegaly and Banti's Disease.*
5. *COWAN, HARRINGTON, AND RIDDELL. *On Pneumopericardium.*
6. GOETSCH, E. *Critical Review: The Pituitary Body.*

1. Warrington discusses in a thorough and interesting manner the pathology and symptomatology of serous effusions within the skull, illustrating his remarks with case reports. These effusions may be acute or chronic. The acute cases, the serous meningitis of Quincke, are most often secondary to a septic focus, usually in the ear. The division between "meningism" and meningitis serosa, on the one hand, and between the latter and purulent meningitis, on the other, is not sharp and distinct, but gradual. The examination of the spinal fluid furnishes the most important distinction. In meningism it is normal, except for increased pressure, which is usually present. (The pressure is often normal.—W. T.) In meningitis serosa the fluid shows inflammatory signs, such as increased protein, increased cell counts, but micro-organisms are usually absent and the fluid is clear. In the chronic cases the symptoms and signs are those of increased intracranial tension, due to an acquired internal hydrocephalus. In these patients the erroneous diagnosis of tumor of the brain is often made, and indeed the differential diagnosis is very difficult. They frequently recover after a decompression, usually with some permanent impairment of vision.

2. Elliott has discovered that acute ulcers of the stomach may be produced in guinea-pigs with great regularity by subcutaneous injection of the substance tetrahydro-B-naphthylamine hydrochloride. The first change appeared in one hour after the injection, and consisted of necrosis of the surface epithelium, often accompanied by small hemorrhages into the mucous membrane. Within 24 hours the ulcers are fully developed, extending down to the muscularis mucosae. They healed with great rapidity unless they became infected. Guinea-pigs that were deprived of food before and after the injection, did not develop ulcers. Chronic ulcers could not be caused by this method. The writer concludes that the ulceration is due to the action of the gastric juice on the damaged mucous membrane. Acute gastric ulcers in man are probably often caused in a similar way by the combined action of the gastric juice and toxic substances.

3. This article contains a careful study of the urine, feces and blood, and the autopsy findings in a typical case of hemochromatosis, a condition in which cirrhosis of the liver and pancreas is accompanied by the deposition of pigment in the skin and internal organs, and in the later stages by diabetes. The most important facts brought out were with reference to the iron metabolism. The blood was found to contain an excess of iron, while the feces and urine contained no iron. In the kidney the interesting discovery was made that the convoluted tubules of the first order contained no iron, while those of the second order and the glomeruli showed large amounts. This suggests that the iron is excreted by the glomeruli, but is taken up again by the tubules of the second order. The hypothesis is advanced that the pigment is derived from nucleo proteins and not from hemoglobin.

4. Gibson describes structures found by him in sections of spleens in cases of splenomegaly, which he regards as parasites of the streptothrix family. He claims that these bodies are the cause of the splenomegaly, although he has observed them only in sections and has not cultivated them. The cases in which he found them included Banti's disease, chronic passive congestion and syphilis.

5. The writers publish a very interesting series of radiographs of a case of pneumopericardium uncomplicated by effusion. The cardiac dullness was not obliterated and the diagnosis was made possible only by x-ray examination. [W. T.]

THE PRACTITIONER.

JANUARY, 1914.

1. BENNETT, W. H. *Some Clinical Experiences in Deceptive Symptoms.*
2. JONES, D. W. C. *Gait in Nervous Disease.*
3. *GRAY, H. T. *Stomach-aches Associated with General Infections in Childhood.*
4. *PRITCHARD, E. *Some Physiological Principles Concerned in the Nutrition of Infants.*
5. HARTLEY, J. *Acute Intestinal Obstruction as It Concerns the General Practitioner.*
6. COCKAYNE, E. A. *Jaundice.*
7. *THOMSON, H. H. *The Diazo- and Russo-Reactions in Pulmonary Tuberculosis.*
8. OLIVER, G. *Practical Points in Sphygmomanometry.*
9. WATSON, A. *Some Observations on the Effect of Hypodermic Injections of Adrenalin on the Blood-Pressure.*
10. MENNELL, J. B. *Massage as a Therapeutic Agent in the Treatment of Neurasthenia.*
11. OLIVER, J. *Painful Menstruation.*
12. SAVILL, A. F. *Some of the Uses of Electricity in Medicine.*
13. GAUNTLETT, E. G. *Recent Work in Surgery.*
14. PIKE, J. B. *Encapsulation as a Factor in Pathology.*
15. JOHNSON, R. *Khargeh Oasis as a Health Resort.*

3. Gray believes that stomach-aches in childhood can be explained by interference with the normal passage of food through the intestine. Such interference may take place in three ways through abnormal conditions:—

1. In the lumen of the intestines.
2. In the intestinal wall.
3. In the mesentery.

Under the first heading he discusses cases of abdominal pain associated with diarrhea; under the second, those rarer cases associated with purpura, in which the chief and often only symptom is pain. Such pain may occur in tonsillitis, diphtheria and other conditions. Under the third heading he considers acute inflammatory conditions, such as appendicitis.

4. Pritchard, in a thoughtful article, considers in detail the physiology and chemistry of digestion and metabolism of infants. The paper is interesting, but not suited for review.

7. Thomson, basing his investigations on 500 cases of pulmonary tuberculosis, concludes in regard to the diazo- and Russo-reactions that (*a*) a persistent diazo-reaction or a combined diazo- and Russo-reaction in pulmonary tuberculosis of recent onset is a sign of serious significance; (*b*) the disappearance of the diazo-reaction is usually associated with general improvement; (c) a positive diazo-reaction with negative Russo- is less serious than the combined reactions; (*d*) these reactions mean severe systemic intoxication and contra-indicate the use of tuberculin.

The Russo-reaction consists in adding 2-3 drops of a 1-1000 methylin blue solution to a small quantity of urine in a test-tube. When positive, the solution changes from peacock blue to an emerald green color. [J. B. H.]

EDINBURGH MEDICAL JOURNAL.

JANUARY, 1914.

1. *KER, C. B. *Isolation and Quarantine Periods in the More Common Infectious Diseases.*
2. *MCNEIL, C. *The Association of Acutely Fatal Illness in Infants and Children with Abnormal Constitutions (Status Lymphaticus).*
3. BRUCE, A. N. *Spinal Changes in Pseudo-Hypertrophic Paralysis.*
4. DUNDAS, W. C. *What is Genuine Milk?*
5. OLIVER, J. *Fertilization Time and the Inception of Gestation in Women.*
6. STRUTHERS, J. W. *Spontaneous Recovery after Perforation of Duodenal Ulcer.*
7. WILKIE, D. P. D. *Case of Osteochondritis Deformans Juvenilis.*

1. This article is full of practical information concerning the acute infectious diseases, their periods of incubation, isolation and quarantine. It presents nothing especially new, however.

2. McNeil discusses from various points of view the subject of status lymphaticus. He divides these cases into three groups: (1) Infants found dead in bed overnight, (2) older children or young adults succumbing during anesthesia, (3) young adults dying suddenly during bathing. He reviews the historical features of this strange condition and then takes up the age incidence, sex incidence, general appearance of the body in these cases and morbid anatomy. This latter he discusses in detail, with special reference to these lymph glands and tissues, suprarenals, thyroid, pituitary, and others. He presents the details of the findings in 13 cases of sudden deaths in infants. The article is carefully summarized, is provided with excellent plates and an elaborate bibliography. [J. B. H.]

THE INDIAN MEDICAL GAZETTE.

JANUARY, 1914.

1. CRAWFORD, D. G. *Surgeon-General James Ellis.*
2. *KENNEDY, R. *Note on Ambulance Transport in Very Difficult Mountainous Country.*
3. MAYNARD, F. P. *A Useful Modification in Extirpation of the Lachrymal Sac.*
4. RIELEY, S. D., AND HOWLETT, F. M. *A Few Observations on Myiasis (Screw-Worm Disease) in Behar.*
5. MILTON, F. *Does Bilharzia (Schistosomiasis) Exist in India?*
6. HOOTON, A. *The Treatment of Simple Fractures, Dislocations and Sprains by Massage and Early Movement.*
7. CHATTERJI, K. K. *A Clinical Lecture on Phylacogen.*
8. HODGE, E. H. V. *Notes on Some Cases.*
9. GOOD, J. *Guttate or Nodular Keratitis.*

2. Kennedy's article is illutsrated by six excellent photographic plates representing ingenious methods of transporting the wounded in rough or mountainous country. [R. M. G.]

MÜNCHENER MEDIZINISCHE WOCHENSCHRIFT.

NO. 2. JANUARY 13, 1914.

1. *FRAENKEL, E. *Skin Lesions in Typhus and Typhoid Fevers.*
2. LEBER, A. AND V. PROWAZEK, S. *A Journey in the South Sea Islands and Dutch Indies.*
3. REICHEL, H. *X-ray Findings and Operation in Carcinoma of the Pylorus.*
4. MAYER, A. *Abderhalden's Dialysis Method. Luetic Index and Its Application.*
6. LESSER, F. *The Quantitative Wassermann Reaction in the Treatment of Syphilis.*
7. KLAUSNER, E. *The Palladin Reaction.*
8. BRONSTEIN, J. *The Technic of Sero-diagnosis.*
9. KIENBÖCK, R. *The Dosage of X-rays.*
10. DÖLGER, R. *A New Suction Ear Syringe.*
11. WEBER, A. *The Registration of the Auricular Pulse from the Esophagus.*
12. *OELLER, H., AND STEPHAN, R. *Clinical Studies with Abderhalden's Dialysis Method. (Conclusion.)*
13. SUDHOFF. *Julius Preuss.*

1. To gross appearances the skin lesions of typhus and typhoid fevers are very similar. Fraenkel has been able to excise the skin in two cases of typhus fever, to fix it immediately and to study the histological changes in the fresh tissue. In typhoid fever, there occurs a true lesion of the skin with collections of organisms and cells, leading to a pressure necrosis. In typhus fever, on the other hand, the small arteries of the skin are affected, with infiltration around them leading to peri-vascular nodules which result in characteristic gross appearances. Fraenkel believes that this lesion is peculiar to typhus, and serves as a means for making a differential diagnosis between the two diseases.

12. Oeller and Stephan give a thorough review of the literature which has accumulated on Abderhalden's dialysis method. The test has been applied in gynecology, psychiatry and internal medicine as a means for diagnosis. In the majority of pregnancy cases, placental tissue is split by a protective ferment in the blood. But the same reaction is obtained in a relatively large percentage of non-pregnant cases. In psychiatry, and in internal medicine, especially in diseases of internal secretion and tuberculosis, several observers have reported brilliant results from the test. Critical studies, however, show that the results obtained have not been specific for any one organ or for any definite type of disease, and therefore Oeller and Stephan feel that the method is not of any special value.

The difficulty with the observations recorded is their lack of proper control. Oeller and Stephan report experiments to prove this, and show how better controls should be made. They conclude that Abderhalden's method cannot be applied for general clinical use until the theory of protective ferments is established more soundly. [R. F.]

No. 3. January 20, 1914.

1. Henkel, M. *Ray Treatment in Gynecology.*
2. Klein, G. *Preliminary Remarks on the Treatment of Carcinoma by the Combined Use of Mesothorium, X-rays, and Intravenous Injections.*
3. Rehn, E. *The Cutaneous and Subcutaneous Connective Tissue as Plastic Material.*
4. *Lust, F., and Rosenberg, F. *The Etiology of Infantile Paralysis.*
5. Fauser, A. *Serology in Psychiatry.*
6. Weinbrenner. *Carcinoma of the Skin Cured by Salicylic Acid.*
7. Beck. *The Stability of Skopolamin Solutions.*
8. *Dietlin, M. *A Case of Unilateral Gigantism.*
9. Mayer, O. *Formaldehyde Spray as a Means of Disinfection with and without Diminished Air Pressure.*
10. Graumann, M. *The Early Diagnosis of Measles.*
11. Strebel, H. *Other Cathodal Rays as Substitutes for Radium and Mesothorium.*
12. Müller, C. *The Physical and Biological Basis for the Use of Radio-active Substances and Their Substitution by Roentgen Rays.*
13. Groth, A. *Vaccination in Bavaria During* 1912.
14. Reichel, H. *X-ray Findings and Operation in Carcinoma of the Pylorus. (Conclusion.)*

4. During 1913, seventy-one cases of infantile paralysis were seen in the Heildelberg clinic. Recent advances in the study of the disease have determined its etiology. One of the theories in regard to its transmission has been that the virus is carried by fowls on account of a disease in these animals which clinically is not unlike poliomyelitis. Lust and Rosenberg conducted experiments to determine whether fowl paralysis showed histological findings which resembled those of infantile paralysis, and whether fowls could be inoculated with the virus.

From their results Lust and Rosenberg concluded that hens were neither artificially or naturally prone to the disease, and that while hen paralysis may be caused by a filterable virus related to that of poliomyelitis, the diseases are not absolutely alike.

8. It is recognized that a certain degree of asymmetry is normal in individuals. Rarely hemihypertrophy or unilateral gigantism occurs when one side of the body develops to a much greater extent than the other. Dietlein reports such a case. There are various theories as to the cause of the overgrowth, certain authors believing that it is due to connective tissue hyperplasia, muscular hyperplasia, or nervous disturbances. None of these factors appeared to play a part in Dietlein's case. He believes that the condition was possibly due to a congenital hemi-elephantiasis caused by abnormal development of the veins on one side of the body. As proof of this was the fact that all the veins of the affected side were larger than on the other side. [R. F.]

Obituary.

ROSWELL PARK, M.D.

Dr. Roswell Park, who died on Feb. 15, at Buffalo, N. Y., was born on May 4, 1852, in Pomfret, Conn. He received the degree of A.B. from Racine (Wis.) College in 1872, and that of M.D. in 1876 from Northwestern University. From 1877 to 79 he was demonstrator of anatomy at the Women's Medical College, Chicago, and adjunct professor of anatomy at Northwestern University from 1879 to 82. In the latter year he became lecturer on surgery at the Rush Medical College, Chicago, and in 1883 surgeon to the Buffalo (N. Y.) General Hospital and professor of surgery at the University of Buffalo. In 1891 he published "Lectures on Surgical Pathology." In 1892 he received on honorary degree of M.D. from Lake Forest University, and in 1895 an honorary A.M. from Harvard. In 1896 he published his "Text-Book of Surgery," in two volumes, and in 1897 his "History of Medicine." In 1902 he received an honorary degree of LL.D. from Yale, and in 1907 published "The Principles and Practice of Modern Surgery." He was a former president of the American Surgical Association and of the Medical Society of the State of New York. He is survived by his widow.

Correspondence.

PAIN FROM FRONTAL SINUS DISEASE.

Boston, Feb. 20, 1914.

Mr. Editor: In the number of the Boston Medical and Surgical Journal for Feb. 19th, 1914, page 283, there is a statement which seems to me to be incorrect. According to my experience, pain from frontal sinus disease begins in the morning and usually disappears or diminishes in the afternoon. Your editorial says that the headache comes on regularly in the afternoon or toward evening, which is certainly contrary to what is taught in all text books dealing with diseases of the nose.

Yours truly,
John W. Farlow, M. D.

Miscellany.

CHANGES IN THE MEDICAL CORPS, U. S. NAVY, FOR THE TWO WEEKS ENDING FEBRUARY 14, 1914.

January 21, Surgeon J. A. Murphy ordered to the *Michigan.*

February 2, P. A. Surgeon J. B. Mears, detached: *Cincinnati* to home.

P. A. Surgeon C. E. Strite, detached: *Michigan* to home.

February 3, Surgeon R. R. Richardson, to Naval Training Station, Great Lakes, Ill.

P. A. Surgeon F. H. Brooks, to Navy Yard, Norfolk, Va.

Asst. Surgeon J. J. O'Malley, to Naval Hospital, Norfolk, Va.

Surgeon H. E. Odell, to Naval Hospital, Canacao, P. I.

February 4, P. A. Surgeon E. O. J. Eytinge, detached: Naval Hospital, Mare Island, Cal., to treatment at that Hospital.

February 5, Surgeon C. N. Fiske, to Navy Yard, Mare Island, Cal.

P. A. Surgeon C. B. Munger, to Receiving Ship, Puget Sound, Washington.

P. A. Surgeon W. S. Hoon, detached: Mare Island Yard, to *Pittsburg.*

P. A. Surgeon W. H. Short, detached: Naval Station, Guantanamo, Cuba, to temporary duty Receiving Ship, Mare Island, Cal.

P. A. Surgeon F. W. P. Hough, detached: Insular Government, P. I., to *Cincinnati.*

P. A. Surgeon E. C. White, detached: Naval Hospital, Canacao, P. I., to home and wait orders.

February 7, Commissioned from:

Surgeon W. S. Hoon, from November 14, 1913.
P. A. Surgeon A. B. Davidson, from March 28, 1913.
P. A. Surgeon J. J. O'Malley, from October 8, 1913.
P. A. Surgeon R. F. Sheehan, from October 5, 1913.
P. A. Surgeon W. H. Halsey, from October 1, 1913.
P. A. Surgeon W. J. Riddick, from March 28, 1913.
P. A. Surgeon D. C. Walton, from March 28, 1913.
Asst. Surgeon W. W. Wickersham, from January 14, 1914.

February 12, Surgeon R. E. Hoyt, detached: *Michigan;* to sick leave.

P. A. Surgeon Heber Butts, detached: *Elcano* to *Wilmington.*

P. A. Surgeon Martin Donelson, detached: *Wilmington* to Naval Station, Iloagapo, P. I.

Asst. Surgeon R. C. Davis, detached: Naval Hospital, Canacao, P. I., to *Elcano.*

February 6, Medical Director C. F. Stokes, detached chief of Medicine and Surgery; to temporary duty in connection with that bureau.

Surgeon F. E. McCullough, to temporary assistant to Bureau of Medicine and Surgery.

Surgeon T. W. Richards, detached: Bureau of Medicine and Surgery, to fleet surgeon, Atlantic Reserve Fleet.

UNITED STATES PUBLIC HEALTH SERVICE.

EXAMINATION OF CANDIDATES FOR ASSISTANT SURGEON.

A board of commissioned medical officers will be convened to meet at the Bureau of Public Health Service, 3 B Street, S.E., Washington, D. C., on Monday, March 9, 1914, at 10 o'clock a. m., for the purpose of examining candidates for admission to the grade of assistant surgeon in the Public Health Service. Examinations will be scheduled to be held at other stations of the Service at a later date.

Candidates must be between 23 and 32 years of age, graduates of a reputable medical college, and must furnish testimonials from two responsible persons as to their professional and moral character, one preferably being from a Doctor of Medicine.

For invitation to appear before the board of examiners, address "Surgeon General, Public Health Service, Washington, D. C."

NOTICES.

MASSACHUSETTS GENERAL HOSPITAL.—A surgical meeting open to the medical profession will be held at 8.15 p. m., Friday, Feb. 27, 1914, in the lower amphitheatre of the Out-Patient Department. Entrance on either Blossom or Fruit Streets.

Dr. Channing C. Simmons will present "Treatment of Osteomyelitis."

Dr. Beth Vincent will present "Choice of Methods of Technic in Transfusion of Blood."

THE HARVEY SOCIETY. — The ninth lecture will be delivered on Saturday, February 28th, at 8.30 p. m., at the New York Academy of Medicine, 17 West 43d street, by Prof. Richard P. Strong, Harvard University.

Subject: "The Etiology of Oroya Fever and Verruga Peruviana."

THIRD INTERNATIONAL CONGRESS ON OCCUPATION DISEASES.—The undersigned committee has been organized for the purpose of inviting the attention of the Medical Profession and all others interested in the prevention of Occupational Diseases to the Third International Congress on Diseases of Occupation to be held in Vienna in September, 1914.

Among the topics which will be considered at the coming Congress are:

1. The physiology and pathology of fatigue, with special reference to vocational work and to the effects of night work on the nervous system.
2. Work in hot and damp air.
3. Occupational Anthrax
4. Pneumononiosis.
5. Injuries caused by electricity.
6. Industrial poisons.
7. Injuries of hearing caused by industrial pursuits.
8. Miscellaneous communications.

SOCIETY NOTICES.

BOSTON SOCIETY OF MEDICAL SCIENCES.—The Boston Society of Medical Sciences announces a meeting of the Harvard Medical School Historical Society (Wm. J. Kerr, Secretary), on Tuesday evening, March 3, 1914, in the amphitheatre of the Peter Bent Brigham Hospital, at 8.15 o'clock. Program:

Dr. Fitz: "Caleb Hillier Tarry on Exophthalmic Goitre."

Dr. Walton: "Medical Saints in Art" (illustrated).

Dr. W. S. Thayer: "Notes on Cotton Mather."

THOMAS ORDWAY, *Secretary and Treasurer,*
Harvard Medical School.

APPOINTMENTS.

The following appointments to the Medical Staff of the Boston Dispensary have been made: Dr. John H. Bufford, Physician in the Dermatological Department; Dr. W. G. Funnell, Assistant Surgeon in the Eye Department; Dr. J. H. Blaisdell and Dr. Harold W. Dana, Assistant Physicians in the Dermatological Department; Dr. Leroy A. Luce, Physician in the Electrical Department; Dr. W. L. Quennell, Dr. Edward Martin, and Dr. Samuel G. Paolo, Assistants to the Physicians in the Children's Medical Department.

RECENT DEATHS.

DR. HORACE EUGENE MARION, a Fellow of The Massachusetts Medical Society, formerly chairman of its Committee on Medical Diplomas, Medical Director of the 2d Brigade, M. V. M., died in his automobile of heart disease at Boston, February 8, 1914, aged 70 years. He was a native of Burlington, Vt., and a graduate of Dartmouth College with the degree of B.S. in 1866 and M.D. in 1869. He had lived and practised in Brighton since 1870. He was a member of the Obstetrical Society of Boston and was much interested in Masonic and G. A. R. affairs.

DR. ALBERT H. TOMPKINS, who died recently in Jamaica Plain, was born at Little Compton, R. I., in 1844. He received the degree of M.D., in 1875 from the Boston University Medical School. He was a member of the American Institute of Homeopathy and of the Massachusetts and Boston Homeopathic Medical Societies. He is survived by his widow and by one son.

DR. CLAUDIUS L. HOYT, who died of nephritis recently in Manchester, Mass., was born at that town in 1851, and had practised dentistry there for many years.

DR. STANLEY HOWARD MACGILLVARY, of Brooklyn, N. Y., died on February 16 at St. Mary's Hospital, after an operation for appendicitis. He was a native of Sydney, Cape Breton Island, and 45 years of age, and was graduated from Bellevue Hospital Medical College, New York, in 1890.

DR. WILLIAM KELLY SIMPSON of New York, professor of laryngology in the medical department of Columbia University, died from cerebral apoplexy on February 6. He was born in Hudson, N. Y., on April 18, 1855, and was graduated from Cornell University in 1876 and from the College of Physicians and Surgeons, New York, in 1880. He served as interne at the Presbyterian Hospital, and after engaging in private practice became well known as a specialist in diseases of the throat, ear and nose. At the time of his death Dr. Simpson, in addition to his professorship at Columbia, held the positions of laryngologist to the Vanderbilt Clinic, consulting otologist to the Presbyterian Hospital, and consulting laryngologist to Seton Hospital, the New York Foundling Hospital, St. John's Riverside Hospital, Yonkers, and Somerset Hospital, Somerville, N. J.